VOL. XXXI. CLEVELAND, O., APRIL 13, 1905. No. 15.

NEW STEAMER FOR NIAGARA NAVIGATION CO

The Niagara Navigation Co. has placed an order for the construction of a new steel steamer, especially designed and arranged for the express passenger service betwen Toronto and Lewiston, N. Y. The new steamer has been designed on the same general lines as the Chippewa and Corona, but differs from them in that she will be propelled by twin screws instead of paddle wheels, and will have her internal arrangements planned on the most modern lines to afford the greatest accommodation and comfort for passengers. The steamer will have the following dimensions:—length, 317 ft. 6 in. over all; beam, 51 ft. 8 in.; depth, 15 ft., molded; draught, 10 ft. She will be driven by twin screws, power being supplied by two sets of engines of the vertical inverted, direct acting, quadruple expansion type, balanced on the Yarrow, Schlick and Tweedy system, having cylinders 17½ in., 25 in., 36 in., and 52 in. diameter, by 30 in. stroke. Steam will be supplied by six Scotch marine boilers at a working pressure of 210 lbs. The Ellis & Eaves suction system of forced draft will be fitted. The steamer is to have a guaranteed speed of 22½ miles an hour, so that in all probability the engines will be capable of making a speed of about 20½ knots an hour. The hull will be constructed of steel, and will be divided into eight compartments by seven watertight bulkheads, thus rendering her practically unsinkable. The steamer will have two smoke stacks similar to the other vessels of the line.

The vessel is planned on the lines of the day service observation type of steamers, having four principal decks, namely, main deck, promenade deck, upper promenade deck, and lower or orlop deck below the main deck. There will be three gangways on each side, the forward ones for passengers and express, the middle ones for passengers' baggage and the aft one for passengers only. This latter will lead directly into the entrance hall on the main deck, at the forward end of which will be found the purser's office, a parcel checking room and other offices with which passengers have to come in contact. At the aft end will be the ladies' retiring room, which will be specially fitted for the comfort and convenience of ladies, and will include a number of new features. At the forward end a staircase 7 ft. wide will connect the entrance hall with the promenade deck above. The dining-room will be forward on the main deck, and will be fitted with large observation windows on each side, so that an uninterrupted view may be had. It will have a seating capacity for 150. The main deck will be of steel covered with wood, and interlocked rubber tiling will be used as a flooring in several parts of the vessel devoted to passenger accommodation. On the promenade deck the principal feature will be the general saloon, which will extend the full width of the steamer. It will be a particularly handsome apartment, and the sides, instead of being straight, will consist of a series of bow windows, so that views may be had ahead and astern as well as straight out. At each bay seats will be provided so that small parties may keep together. Two of the bays will be finished as private parlors, which will be available for letting to parties who desire to be alone. The upper promenade deck, which will be reached by a stairway from the general saloon, as well as by stairways from outside on the promenade deck, will extend over the whole vessel, instead of ending just forward of the wheelhouse as in most vessels of this type. The rail will be inside the lifeboats, and the entire width of the deck will be available for passengers. The captain's quarters, the wheel house, and the pilot's room will be on this deck. A light shade deck amidships will give shelter over this deck. The space over the engine room, instead of being closed in with steel plates, will be surrounded with a framework in which plate glass sides will be fixed so as to enable passengers to have a view of the machinery. On the lower or orlop deck will be found the crews' quarters, kitchens, smoking room, engines and boilers, etc. The whole of the interior has been planned so as to provide the greatest accommodation for the passengers, and for the convenience of the crew in working the steamer.

The decorations will be particularly striking. The entrance hall will have a heavy beam ceiling; the main stairway will be in cathedral oak; the dining-room in mahogany, and other portions of the passenger accommodation in weathered and quartered oak. The designs show some very fine effects and will present a rich and artistic appearance. The furnishings of the various rooms will be in harmony with the general decorative design and color scheme.

The steamer will be constructed by the Canadian Ship Building Co., Toronto, of which F. Nicholls is president, and A. Angstrom, general manager. It will be ready for service in 1906.

War vessels were sold at Chatham dock yard to the highest bidder last week. The amount realized was $690,600. The loss included twelve cruisers among them being the Warsprite, the Northampton, the Galatea and the Australia, two torpedo boats and the training ship Exmouth. The terms of sale provided that none of the vessels could be sold to a foreign power. All of them must be broken up within twelve months. The ships sold represent an original outlay of $15,000,000.

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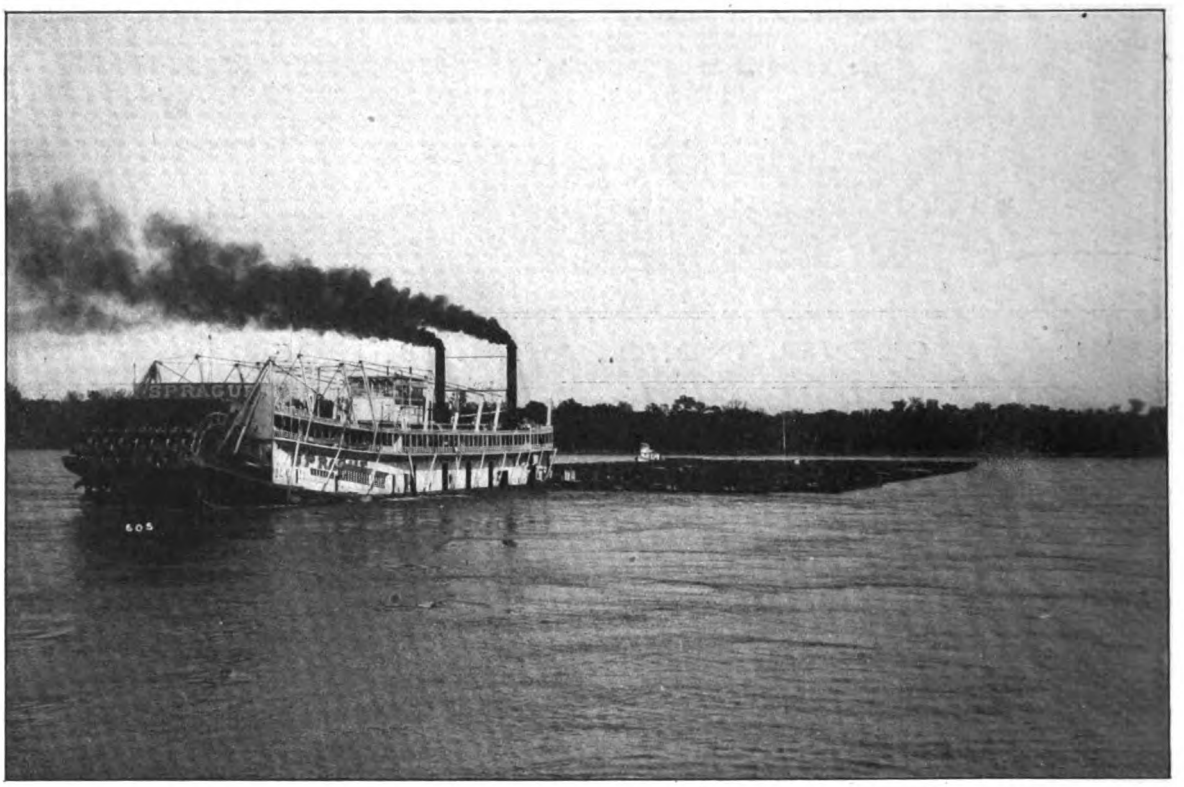
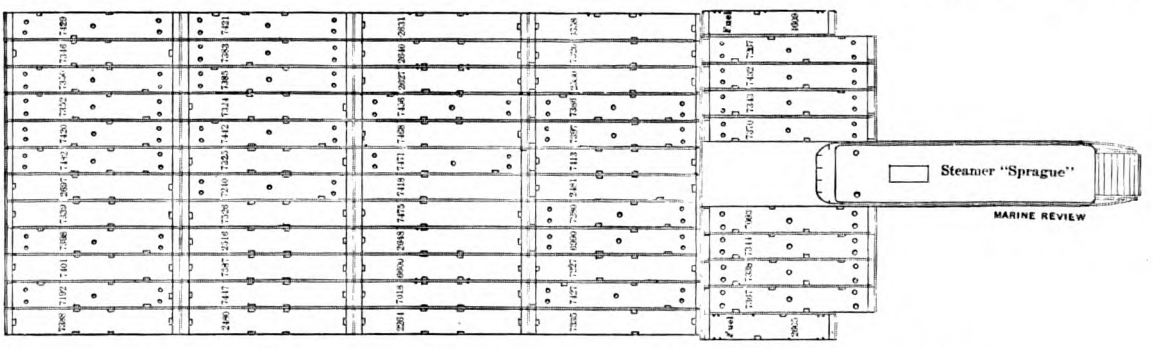
RECORD BREAKING TOW

In May, 1904, the steamer Sprague, owned by the Monongahela River Consolidated Coal & Coke Co., broke all previous records by taking a tow of fifty-six coal boats down the Mississippi to New Orleans, containing 1,400,000 bu. of coal weighing 53,000 tons. This breaks all cargo records of any kind and there is little danger of the honors being taken from the Sprague by any craft afloat. Nor is it believed that it is the largest cargo that can be taken down stream by this river steamer, and when the proper boating stage has arrived this year an effort will be made to break this record. The Sprague is one of the largest tow boats on the rivers, her engines developing 2,500 H. P., and is 315 ft. long and 64 ft. wide. Her hull is of steel construction to her boiler deck. The length of the steamer Sprague and her tow was 1,132 ft. and the width 312 ft. The area covered by the fifty-six coal boats was 5.9 acres. In addition to the fifty-six coal boats two fuel barges were included in the tow. The tow was made up of four rows of boats twelve abreast and on either side of the Sprague were eight coal boats and two fuel barges. The coal was consigned to New Orleans and the tow was made up below Cairo, Ill., and twelve days were required in reaching the Southern port.



STEAMER SPRAGUE PASSING MEMPHIS, TENN., MAY 17, 1904, WITH FIFTY-SIX CANAL BOATS CONTAINING 1,400,000 BU. OF COAL. LENGTH OF STEAMBOAT AND TOW, 1,132 FT.; WIDTH OF TOW, 312 FT.

The Monongahela River Consolidated Coal & Coke Co., Pittsburg, is the largest transportation concern on the Ohio and Mississippi rivers and their tributaries. This company owns and operates 1,500 coal boats, 1,200 barges, sixty-nine freight or model barges, 100 fuel barges and 250 flats. It annually ships below Pittsburg about 3,000,000 tons of coal to say nothing of the vast tonnage that is delivered to the large manufacturing plants in the Pittsburg harbor and not included in the lower river shipments. The company operates sixty-three steamboats from Pittsburg, two from Cincinnati, three from Louisville and seven from Cairo, Ill. The lower river boats are used extensively in towing freight, lumber, ties, etc., out of the Cumberland, Tennessee, Green, Ohio and Mississippi rivers. About fifty barges are used in taking care of this business. In addition to the above the company operates in the lower Ohio and Mississippi rivers eighteen tug boats. The steamers Sprague and J. B. Finley are the largest owned by the company. In the transportation of its record cargo of coal to the south the Sprague carried a crew of seventy men.



SKETCH SHOWING STEAMER SPRAGUE AND TOW AS IT PASSED MEMPHIS MAY 17, 1904.

The steamer J. B. Finley tows from Pittsburg twenty-four coal boats and below Louisville from thirty-four to forty coal boats. Bridge abutments alone in the lower Ohio prevent the

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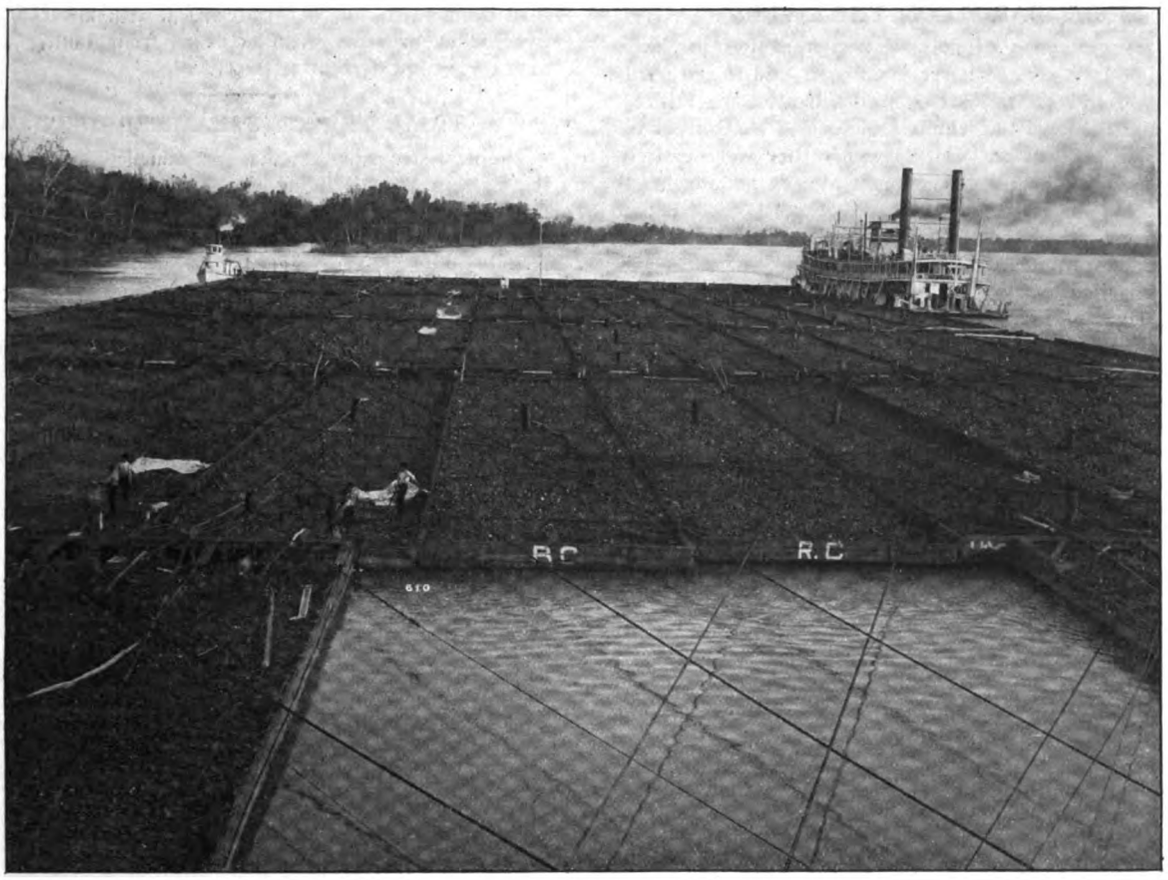

VIEW SHOWING METHOD OF MAKING UP SPRAGUE COAL FLEET.

towing of larger fleets of coal boats and for this reason the record tow of the Sprague was made up below Cairo, Ill.

FOREIGN TRADE TONNAGE

Editor Marine Review: More foreign-trade tonnage cleared from the port of New York in 1904, than from Liverpool, London, or any port in the world in 1903, except Antwerp and Hongkong.

More foreign-trade tonnage entered the port of New York in 1904, than entered Hamburg, Liverpool, Antwerp, Rotterdam, or any port in the world in 1903, except London and Hongkong.

The figures follow for the ports named, and other of the world's more important ports.

	Entered	Cleared
New York	9,235,524	8,700,590
London	10,958,739	8,104,890
Liverpool	7,817,050	6,682,568
Antwerp	9,073,021	9,104,275
Hongkong	9,612,202	9,592,597
Hamburg	8,244,660	8,450,132
Rotterdam	6,934,760	6,662,860
Shanghai	6,179,554	6,162,981
Singapore	6,011,257	5,993,662
Colombo	4,739,286	4,700,346
Cardiff	4,988,907	8,190,249
Marseille (1904)	5,061,912	4,645,467
Kobe, Japan	3,864,587	3,840,565
Yokohama	2,545,292	2,490,397
Genoa	3,776,659	3,113,270
Buena Ayres	3,389,254	3,104,208
Cape Town	3,776,712	3,388,473
Melbourne	3,252,702	3,234,588

Cardiff's large excess of clearances over entrances—more than 3,000,000 tons—is owing to the fact that so many outward-bound ships coal there, and get their foreign clearance at that port.

The volume of foreign-trade tonnage, in and out, at the far east ports of Hongkong, Shanghai, Singapore, Kobe, and Yokohama, is surprisingly large. The figures denote the immense value of the far east trade, and give us a glimpse of the future value of the American port of Manila, and the American Panama canal. The nearly 600,000 tons excess clearances from New York over those from London, show New York's export leads over that great city. On the other hand London's 1,723,000 tons excess entrances over the figures for New York, demonstrates Great Britain's import lead. From the balance of foreign-trade point of view New York's lead in entering and clearing tonnage over London is about 2,300,000 tons. Bureau of Statistics figures are quoted herein.

WALTER J. BALLARD.

Schenectady, N. Y.

BURTON ON PORTO RICO

The members of the rivers and harbors committee of the house of representatives have just concluded a tour to Porto Rico. Speaking of the Porto Rican harbors Hon. T. E. Burton, chairman of the committee, says:

"Our principal object was to visit San Juan, Ponce and Mayaguez harbors, and also the proposed harbor in the island of Culebra. The harbor at Culebra is planned confessedly as a naval proposition, and would not be improved except for that purpose. There is a very large sheltered anchorage in the center of the southerly part of the island. By dredging the interior space and widening the entrance space could be provided for ten battleships and a number of smaller boats. The improvements most needed in the harbors of Porto Rico, especially at Ponce and Mayaguez, are largely those which should be undertaken by private enterprise or by the insular government, such as wharves for loading freight and terminal facilities. At the same time, there is a considerable amount of work which the general government might well undertake. We were all very much pleased with the island of Porto Rico and gratified to note the apparent improvement in conditions there."

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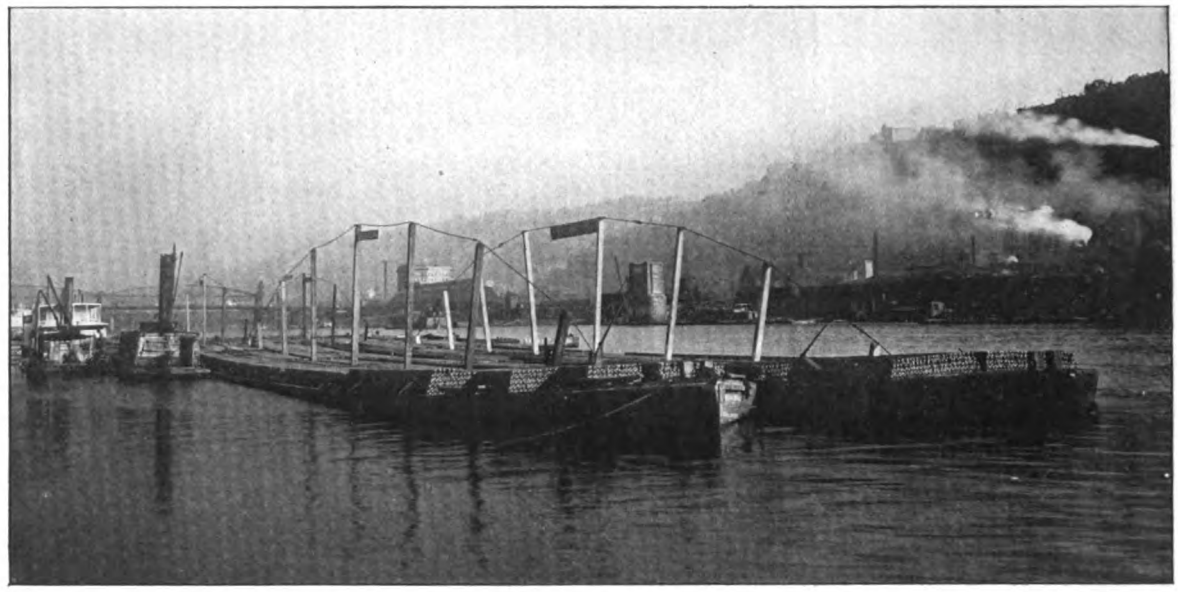
MODEL BARGES ON THE RIVERS

In the transportation of finished iron and steel products, glassware, pottery, etc., to lower Ohio ports and to the south on the Ohio and its tributaries model barges are utilized. Unlike the coal barges their hulls are modeled along the lines of the hull of a steamer. Until recently they were entirely built of wood, but steel construction is already making headway and a number of these barges of steel construction throughout are already in use on the rivers. The majority of the models now in use are 225 ft. long and 36 ft. wide, and are usually loaded to a depth of 9 ft. Their carrying capacity varies from 900 to 1,500 tons. The Monongahela River Consolidated Coal & Coke Co., Pittsburg, owns sixty-nine model barges, all of wood construction and transports from 150 to 175 barge loads a year from Pittsburg and lower Ohio ports to southern ports.

Owing to the uncertainties of the barge water stages under the present freshet system, and the consequent uncertainty of delivery of cargoes, this shipping is still in an undeveloped stage, but with an improved 9-ft. channel on the Ohio, this traffic would grow to tremendous proportions. The principal iron and steel products now shipped to the south from the mills in the Pittsburg district consist of rails, wire nails and wire products, cotton ties and hoops and bands. The American Steel & Wire Co. makes heavy shipments on every barge stage to its warehouses in Louisville, Memphis and New Orleans while the shipments of cotton ties to southern points is always heavy in the earlier months of the year. For the baling of its cotton crop the south requires 50,000 tons of ties annually and with an improved waterway every ton would be shipped over the Ohio and Mississippi rivers, entailing a big saving to the southern planters who are now compelled to pay heavy freight rates to the railroads on the tonnage that cannot be taken in barges.

The rates now offered to shippers from Pittsburg to New Orleans are as follows: Rails, $3.50 per ton; wire nails and wire products, $3.75 per ton, and cotton ties and hoops and bands $4.00. Rates as low as $2 a ton have been made on good barging stages and when competition was keen among the transportation companies, and would no doubt prevail with an improved channel. During 1903 there were shipped from Pittsburg 45,106 tons of steel rails, while the tonnage of other miscellaneous iron and steel products amounted to 69,719 tons. A deeper channel would result in the shipment by model barges of a still wider range of finished iron and steel than enumerated, and it is only the present uncertainty of delivery that prevents manufacturers from taking advantage of the very low freight rates offered.



MODEL BARGES LOADED WITH STEEL RAILS IN PITTSBURG HARBOR.

TRIAL TRIP OF STEAMSHIP DAKOTA

The new steamship Dakota, just completed at the works of the Eastern Ship Building Co., New London, Conn., for the Great Northern Steamship Co. of Seattle, Wash., left New London harbor on March 23 on her trial trip outside of Long Island sound. She returned to New London on the 24th after a trial sea trip of twenty-four hours. During the trip her compasses were adjusted and her machinery given a thorough trial, which is said to have been satisfactory. The Dakota left New London for Newport News on the 27th, where she will be docked and painted. She will load 6,000 tons of steel rails at Baltimore for San Francisco and Seattle, as soon thereafter as possible. From Baltimore she goes to New York to take on a cargo of general merchandise. The Dakota is 608½ ft. long, 73½ ft. beam and 41 ft. 5 in. depth of hold. She registers 21,000 gross tons and 13,305 net, upon which she can carry about 27,0000 tons dead weight cargo. Capt. Francke has been appointed master of the big vessel.

THE LARGEST SAILING SHIP IN THE WORLD

The Rickmers, the largest sailing ship in the world, is now in course of construction at Geestmunde for the Rickmers company of Bremen. The vessel will be a five-masted bark of 11,350 tons displacement with a dead weight carrying capacity of 8,000 tons and will have a length of 441 ft. She will have auxiliary power consisting of triple expansion engines of 1,000 H. P. placed amidships with coal bunkers of 605 tons capacity. Her auxiliary power will be put into play on entering and leaving ports and during calms, and she will have a speed under steam of six to seven knots loaded and seven to eight knots ballast. There will be a double propeller, with two branches, the four blades of which will fold into a vertical plane when not in use.

M. Rabbitt & Sons, Toledo, O., contractors for the new St. Clair Flats canal have begun operations for the season. During the winter the firm constructed the hull of the new hydraulic dredge Algonac and new machinery built by the Morris Machine Co., Baldwinsville, N. Y., will be installed in it.

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LAKE UNDERWRITING

Buffalo, April 11.—The insurance underwriters of the great lakes are also among those who find everything shifting about them quite after the fashion of the other branches of the lake trade. It would seem that insurance ought to develop some element of steadfastness and permanence if anything can, but it seems to be too much under the influence of other changing items on the list. In the first place there is more capital in the business than for a long time, so that it is easy to cover a risk now with the lakes filled with great craft as it used to be hard when the single risk was not half what it is now. I hear no explanation of this, so it may be set down as one of the results of surplus capital seeking a small earning rather than be idle, for it does not appear that the lake risks have been paying very liberally of late.

Of course the change has come largely about on account of the control of the business passing over to London instead of remaining in New York, where it was twenty years ago. New York or any other American center would hardly be satisfied with the earning that lake insurance has afforded of late, yet London must put up with what is always a small income from some of its many branches of the insurance business if it is to make money on the entire volume of it and especially if it is to retain its old control of the business. It is the very light earning itself that appears to be at least one good reason for the hold of its lead in insurance. It appears that the steel hull business remains fairly firm as yet and may continue so through the season, spite of the opportunity for competition afforded by plenty of capital. It was the failure of rival combinations of underwriters in the old days to cover a big risk separately that drove out competition, now it is the light earning as much as anything.

There is not much really settled in regard to the insurance of the wooden fleet, except that a total loss is to be that literally now, the 100 per cent clause being firmly fixed as one of the requirements. To an outsider the "constructive total loss" idea was always an oddity, especially when it meant anything more than 50 per cent. It did permit the insurance authority to step in and take charge of a wreck and save it if possible, where the owner was unable to do so, or sometimes not so very anxious to, but it was always making the companies pay a total loss on a few vessels every year that were sailing next season as good as ever.

One thing is certain, there will not be much of a scramble for this class of risk this season, if there is no agreement on rates, for it has seemed impossible to fix a rate on such vessels for quite a long time that was at all satisfactory to either owner or underwriter, so the whole business was thrown out, for any individual underwriter to take or refuse as he and his companies thought best. And they say this predicament is in the main owing to the stiff increase of "moral risk" lately. Taken all together business is queer stuff. We no longer sail down on our victim with a black flag flying and no quarter offered, but we do exactly the same thing in the handling of our interests, calling it excellent "business" and not piracy to succeed by cutting a rival, sometimes a brother, out of trade by competition or by saddling our obligations on him.

The cargo business in insurance is quite varied. Lumber, that used to be a disastrous risk, is now firm and paying. There is expected to be competition on grain and package freight, while the coal rates are so low that a single total loss of a big cargo would wipe the entire gross earning out. So the underwriters are having their ups and downs, quite as much as ever, though as London says "Go ahead" there will be business done much as before. Anyhow the lake trade is a small part of the London whole and it is not so sharply watched as some other branches of that vast business is.

JOHN CHAMBERLIN.

CANADIAN SHIPPING NOTES

A Mr. Campbell at one time manager of the Northern Navigation Co. of Ontario, died at Toronto, March 25.

T. Sadler has been appointed a measuring surveyor of shipping for the port of Lindsay, Ont.; and H. Plummer has received a similar appointment for the port of Sault Ste. Marie, Ont.

Capt. Charles Cameron of Collingwood, Ont., for many years connected with steamboat interests on the Georgian Bay, and a former director and vice president Northern Navigation Co., died at Toronto, March 23.

The Canadian Pacific Ry.'s upper lake steamers will make Sault Ste. Marie, Ont., its regular port of call. Heretofore the steamers have called only at the Michigan Soo on their regular trips between Owen Sound and Sault Ste. Marie.

Speaking a few days ago in the house of commons the minister of marine stated that the icebreaking steamer Montcalm had proved to be a complete success. She was able to break the ice at Cape Rouge as far as is necessary in order to have the channel open early in the spring. At times she had to encounter 20 ft. of ice. In her work during the winter she lost in all six propeller blades.

The Dominion parliament at its current session has voted $558,000 for the further prosecution of the widening and deepening of the St. Lawrence ship channel and other work on the St. Lawrence river. The work to be undertaken apart from the deepening of the channel includes the maintenance of the Sorel yards, the construction of additional dredging plants; the sweeping and supervision of the channel, and the building of a number of piers for stationary lights in the channel, to be used after the ice begins to form.

The Richelieu & Ontario Navigation Co. adopted the practice of naming its new steamers after cities and towns of their respective routes, viz: Kingston, Toronto, Montreal. It has now obtained authority from the department of marine to change the names of its other steamers not named after cities, as follows: Algerian to Cornwall; Bohemian to Prescott; Canada to St. Irene; Cultivateur to Varennes; Corsican to Picton; Saguenay to Chicoutuni; Virginia to Tadousac; and Spartan to Belleville.

The steamer which the Niagara Navigation Co. has ordered will be a steel steamer: length, 317½ ft. in length, 51.8 ft. beam, and 15 ft. depth of hold, having seven watertight bulkheads; and will be propelled by twin screws, driven by quadruple expansion engines, to which steam will be supplied by six Scotch marine boilers. She will have a speed of about 20 knots an hour. The internal arrangements will be planned on the most modern lines to insure the comfort and convenience of the passengers. She will be exclusively a passenger steamer and will run between Toronto and the Niagara river.

The Dominion government has entered into a contract with the Allan Steamship Co. for a regular service between Canada and France. Montreal will be the Canadian port in the season of open navigation, and Halifax, N. S., or St. John, N. B., during the winter. The company can select either Havre or Cherbourg as the terminal port in France. Four steamers are to be placed on the line, and not less than eighteen round trips are to be made annually. This number may be increased to twenty-four if the trade offers. The contract is to extend for three years, and the service is to commence with the opening of navigation.

The Chili-City of Berlin case is now being heard before Judge Landis of Chicago in the United States court at Milwaukee. It is claimed that the Chili ran down the City of Berlin in the Detroit river on Aug. 7, 1904, and sank her The repairs to the Chili amounted to $75,150. Owners of the Chili contend that the accident was due to negligence on the part of the officers of the Berlin and deny all liabilities.

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Published every Thursday by

The Penton Publishing Company,

CLEVELAND, OHIO.

CHICAGO: MONADNOCK BUILDING.
PITTSBURG: PARK BUILDING.
NEW YORK: 150 NASSAU STREET.

Correspondence on Marine Engineering, Ship Building and Shipping Subjects Solicited.

Subscription, $3.00 per annum. To Foreign Countries, $4.50. Subscribers can have addresses changed at will.

The Cleveland News Co. will supply the trade with the MARINE REVIEW through the regular channels of the American News Co.

Entered at the Post Office at Cleveland, Ohio, as Second Class Matter.

APRIL 13, 1905.

Largely as an outcome of the interest created by the tour of the Merchant Marine Commission throughout the country last summer to inquire into the state of shipping in the foreign trade and to seek a remedy for its decline the Merchant Marine League of the United States was organized in Cleveland last fall by the merchants and manufacturers of the middle west. Those that are interested in this league are neither ship owners nor ship builders but are mainly producers concerned in preserving the integrity of the foreign trade under all conditions that may arise. The officers of the organization are Mr. Harvey D. Goulder of Cleveland, president; Mr. Aaron Vanderbilt of New York, vice president; Col. J. J. Sullivan of Cleveland, treasurer; Mr. John A. Penton of Cleveland, secretary. Vice presidents have been elected in five states as follows: Massachusetts, Hon. Samuel L. Powers of Boston; Michigan, Mr. George H. Barbour of Detroit; New York, Mr. O. P. Letchworth of Buffalo; Ohio, Mr. D. B. Meacham of Cincinnati; Pennsylvania, Mr. George E. Bartol of Philadelphia. Vice presidents will be elected in the other states as soon as the membership in each state justifies it. The league's membership at present extends into eighteen states and embraces about 300 persons. The list of first members together with their business addresses has been published in convenient pamphlet form by the league and will be sent to anyone upon application.

The purpose in setting this down so clearly is to relate that shortly after the Merchant Marine League of the United States was organized a circular was received by one of its members from an organization known as the American Maritime League with offices at No. 115 Broadway, New York. The receipt of this circular created considerable surprise because at the time of the organization of the Merchant Marine League no one was aware of the existence of this other organization. The circular contained a long list of vice presidents, called an advisory board, which embraced some of the leading men of the country, including President Roosevelt, members of his cabinet and many men distinguished in various walks of life. Former Senator John M. Thurston was given as the president of the league. It so happened that a personal friend of the gentleman who received the circular of the American Maritime League was represented as one of its vice presidents and members of its advisory board. An inquiry was naturally made of him concerning the status and strength of the organization when it was discovered that he really knew nothing at all about it. Further inquiries were then instituted among the men mentioned as vice presidents and it was discovered that their names had been used greatly without their knowledge or consent. In certain instances some of them vaguely remembered having been approached upon the subject about a year prior. Senator Thurston himself when approached upon the subject last winter did not appear to be well informed upon it.

A few days ago lengthy dispatches were sent out from Washington concerning the organization of the American Maritime League and the language of the dispatches was so framed as to indicate that it was a movement started by eminent men interested in shipping who had been disappointed at the failure of the shipping bill to pass congress at its last session. Surprising to say the names of a number of eminent men who had previously disclaimed knowledge of the organization were again heralded abroad as being its vice presidents and members of its advisory board. Naturally the affair excited suspicion and became a subject of inquiry on the part of eastern papers, the Philadelphia Press taking the initiative. It must be admitted that the organization did not improve upon the closer acquaintanceship instituted with it by the newspapers. No evidence could be discovered that it had fulfilled the promises set forth in its circular; nor did it appear to have any settled habitation or connection with banks. The promoters of it appeared to be H. K. Pommery, S. Elliott Curtis and Kent Holmes, though Curtis later called up the newspapers to say that he had not been connected with it for a year past and Holmes telegraphed to say that he had never even heard of it. This leaves only Pommery.

The country will probably hear no more about the

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affair after tomorrow because Pommery has issued a notice signed by former Senator Thurston calling a meeting of the American Maritime League to be held at the Waldorf-Astoria, New York, on Friday of this week. The call reads as follows:

"The members of the American Maritime League *are hereby* called to attend the meeting at the Hotel *Waldorf-A*storia at three o'clock p. m. on Friday, April 14, 1905, for the purpose of perfecting plans of the organi zation and discussing ways and means by which the league may best accomplish the purposes for which it was formed. Facts of important interest to everyone connected will be brought up and a full report of everything done by the league up to the present time will be made."

It is hoped that a business-like and creditable show*ing may* be made at this meeting though appearances *at present* are against it.

FREIGHT SITUATION

Practically speaking the season of navigation on the great lakes opened on Saturday last when the steamers J. T. Hutchinson and Sultana left Duluth with grain. A number of freighters left Lake Erie ports with coal and undertook the negotiation of the ice in St. Mary's river. The Canadian locks opened on Monday and the American locks on Wednesday of this week. Reports indicate that some of the ore ports are still congested with ice but navigation will undoubtedly be under a full head of steam by the end of the present week. All labor problems are now out of the way and there is a pressing desire on all hands to get the movement of ore under way. Labor conditions have been settled for the season so that no trouble is to be anticipated on that score. The task of closing with labor aboard ship was comparatively an easy one to that which confronted the dock managers who were in session with the longshoremen for two full weeks. The longshoremen secured a very good settlement indeed. They have for several years wanted the docks operated on a ten-hour basis but the managers have never felt that they could really afford to do so. However, they offered to try the ten-hour day after Sept. 1 and up to that time the men will work eleven hours a day. The scale of wages also represents a general advance. The ore shovelers will get the wages that were paid in 1903 which were 7½ per cent in advance of those paid last year. The shovelers will be paid at the rate of 14 cents per ton; the operators of the clamshells of over two tons capacity will get $105 per month and operators of clamshells of less than two tons capacity will get $90 a month. Day laborers will receive 21 cents an hour and the men that work with the automatic machines in the holds of the vessels will be paid at the rate of 28 cents an hour, which is an advance of 3 cents over last year. The dock managers closed also with the coal handlers upon the scale of 1903, which means an advance in their case. The dock managers have advanced the unloading charges of the vessels from 19 to 20 cents per ton. The unloading charge of 1903 was 21 cents per ton.

Wild chartering in ore has opened upon the contract rate which is 75 cents from the head of the lakes. Coal charters have also opened at the contract rate, which is 35 cents to the head of the lakes, but very few charters are reported. It is not likely that the coal trade will open strong before May 1, but it will give the smaller class of vessels considerable to do because a great number of the larger carriers have been reserved exclusively for the ore trade during the present year. The conservative element is now predicting that the ore movement will reach 30,000,000 tons. Indeed it would not be surprising if it reached 32,000,000 tons, but of course circumstances may arise to change this total. The iron trade is subject to great fluctuations and any falling off in consumption during the latter part of the year would effect the total movement.

LAUNCH OF THE ELBERT H. GARY

The steamer Elbert H. Gary building for the Pittsburg Steamship Co., the lake end of the Steel Corporation, was launched from the Chicago yard of the American Ship Building Co. on Saturday last. The Gary is the largest vessel to be launched on the great lakes and was named by Mrs. R. W. Campbell, the daughter of Judge Gary. The launch was witnessed by Mr. Harry Coulby, president and general manager of the Pittsburg Steamship Co., Mr. A. F. Harvey, Mr. James C. Wallace, Mr. Robert Logan and Mr. E. M. Richardson of Cleveland The Gary is 569 ft. over all, 549 ft. keel, 56 ft. beam and 31 ft. deep. She has thirty-four hatches, spaced 12-ft. centers and while it was the original intention to make her cargo hold continuous the plans were subsequently changed to include one bulkhead, so as to divide her cargo into two parts. The sides of her hopper incline until within 9 ft. of the tank top when they descend in a straight line. Her girders are straight and not arched as in the Wolvin and Wallace. The Gary will be equipped with triple-expansion engines with cylinders 24, 39 and 65 in. diameters by 42 in. stroke, supplied with steam from two Scotch boilers, 15 ft. 4 in. in diameter and 11½ ft. long, fitted with Ellis & Eaves draft. She will be lighted throughout by electricity and her auxiliary equipment will be very complete, including steel hatch covers operated on the telescope principle. The Gary will be commanded by Capt. Richard Jollie and Mr. J. Dupont will be her chief engineer.

After the launch a number of speeches were made in the course of which the speakers referred with pride to the great growth of the lake marine and of the ships that were coming along and made up the fleet. One of the after-dinner talkers was the assistant general manager of the Oliver Iron Mining Co., which furnishes these ships with their cargoes. In his remarks Mr Powell, after congratulating the gentlemen present on the growth of their magnificent industry, the building and equipping of such vessels as the Gary, said that he knew more of the mining of ore than the transportation of it, and that he wanted those present to remember that in the branch with which he had the honor to be associated there was also progress and growth, and that they had in northern Minnesota a mine that could without any difficulty turn out in a short season up to 2,000,000 tons of ore, an amount that would make 200 cargoes for such ships as they had seen launched that afternoon. This contrast was an interesting one and quite valuable for comparison.

NEW BOX FACTORY AT DULUTH

Duluth, April 12.—Deals that have been under way for some time for the establishment of a large box factory at Duluth have practically been closed. The owner of a very large factory in the middle west, a factory that has been cutting up from 50,000,000 to 60,000,000 ft. of lumber yearly, has associated himself with Thos. Lowry of Minneapolis, who is the owner of the property to be used, and they will be at work in a very short time, unless present plans miscarry. They plan to add new machinery to the amount of about $50,000 to the large amount already in the shops, and to be in shape to cut up 20,000,000 ft. a year from the start. They will occupy the erecting and planing shops of the old car works, one of which buildings is 80 by 500 ft. It is said that the new company has contracts that will occupy them for a year. Their product will go east by lake.

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Ohio River and its Improvement

A matter which congress will be called upon to decide definitely and that before many years is the radical improvement of the Ohio river. The government has been providing funds for the improvement of this river, in a sort of half-hearted way, since 1824, and owing to such action much money has been expended without compensative results. Among those who keep in touch with river and harbor appropriations it is well known that these appropriations are not made in the right spirit, that the welfare of the country is not considered, but rather that they serve as a sort of balm for certain sections, politically. This seems to have been the view taken by Ex-President Cleveland who did not sign such acts. Be this as it may, other nations appear to have faith in inland water transportation and they have expended large sums in providing canals, improving rivers, constructing locks, etc. France has been credited as being the most progressive in this respect; but Germany and England, in fact all the larger European nations, have provided liberally for such improvements. It appears that canal building is a pet scheme of Germany's emperor, and he has been urging for some time the necessity of having additional canals built. A $50,000,000 canal project is receiving consideration at the present time in Germany. Perhaps one of the largest undertakings of this kind under way is that of reconstructing the Erie canal, upon which the state of New York is engaged, and which met the approval of the people as shown by their vote.

The United States contains many valuable rivers the improvement of which is of great advantage. Among these is the Ohio on which there is, no doubt, more traffic than on any other river in this country, excepting the Saint Marys on the northern border, and its improvements would benefit more people than perhaps any two other rivers. The reason for this is not difficult of discernment.

The Ohio river is formed by the confluence of the Allegheny and Monongahela rivers at Pittsburg, Pa.; flows through western Pennsylvania, forms the boundary between the states of Ohio, Indiana, and Illinois on the north and northwest, and West Virginia and Kentucky on the south and southeast; and joins the Mississippi at Cairo, Ill. It is about 967 miles in length. Unfortunately in this distance it has a fall of about 426 ft., 26 ft. of which is overcome by the canal at Louisville, Ky. The following statement shows the distribution of this fall:

Pittsburg, Pa., to Beaver, Pa. (26 miles), fall 15 in. per mile.

Beaver, Pa., to Wheeling, W. Va. (64 miles), fall 9 in per mile

Wheeling, W. Va., to Louisville, Ky. (508 miles), fall 5½ inches per mile.

Below falls of Louisville 4 in. per mile.

It has an average width of about 1,000 feet, and flows through a hilly country for about 700 miles of its length. Its bed consists principally of sand, gravel, rock, and what is known as cemented gravel. Fully 200,000 square miles of territory is drained by the Ohio, which embraces the western part of Pennsylvania; practically all of West Virginia, Kentucky, and Tennessee; the greater part of Ohio and Indiana; and part of New York, North Carolina, Virginia, Alabama, Mississippi, and Illinois. This territory contains some of the most fertile land of the United States, and a vast wealth of coal and oil. About 2,000,000 people reside along the banks of the Ohio; the principal cities, commencing at its source, being Pittsburg, Allegheny and Beaver in Pennsylvania; Wheeling, Parkersburg and Huntington in West Virginia; Steubenville, Marietta, Pomeroy, Gallipolis, Ironton, Portsmouth and Cincinnati in Ohio; Vanceburg, Maysville, Covington, Newport, Louisville, Henderson, Owensboro and Paducah in Kentucky; Lawrenceburg, Rising Sun, Vevay, Madison, Jeffersonville, New Albany and Evansville in Indiana; and Mound City and Cairo in Illinois.

To many it may appear strange that nothing accurate is known of the commerce of the Ohio, but such is the case. Of course attempts have been made to arrive at something approximately correct, but without result. Not even the amount of coal handled on the river each year is accurately known. As given in the last annual report of the chief of engineers, U. S. army, 12,496,842 tons of freight and 4,286,031 passengers were carried during the calendar year 1903; but these figures, no doubt, fall much below the actual amounts.

Assuming that the figures are reasonably correct, they only represent about one-half year's commerce, and that the smaller half. After July, navigation is practically suspended until well into November; four of the best months without a steamboat of reasonable size able to navigate, this too when it is desirable to move the products of the field. During the winter months ice often interferes with navigation. Nor can steamboat navigation on the Ohio be depended upon at any time; this is especially true on the upper stretch, along which are located the large iron mills, glass works, potteries, etc., it also furnishes the greater portion of the coal. The iron and steel output of the upper Ohio ranks with the largest in the United States, but this output is not transported by water.

In considering the Ohio river as an inland waterway, its tributaries must be taken into account; so considered, it is undoubtedly the greatest of our country, excepting of course the great lakes. An idea of the magnitude of this waterway can be had from the following list of its navigable tributaries:

Allegheny river rises in Potter county, Pa., flows through Cattaraugus county, New York, re-enters Pennsylvania, flows southwest and unites with the Monongahela at Pittsburg. It is about 325 miles long, about 250 miles of which are navigable. Congress has provided for three lakes and dams which will extend slack-water navigation about 25 miles from Pittsburg. Much timber is brought down this river.

Monongahela river has its source in Upshur county, West Virginia. It flows through part of West Virginia and Pennsylvania, being about 300 miles in length. There is slack-water navigation for a distance of 131 miles. For years, seven of the locks on this river were owned by a corporation, and the works were allowed to decay. The general government now has charge of all of the improvements which comprise fifteen locks and dams. The coal mined along this river runs into the millions of bushels annually and is used from Pittsburg to New Orleans.

Muskingum river has its source at Cochocton, Ohio, and is 107 miles in length, joining the Ohio at Marietta. Slack-water navigation is carried to above Zanesville, Ohio, a distance of 84 miles by ten locks and dams. At Dresden, a connection was made with the Ohio and Erie canal, but this route is seldom used, owing to the poor condition of the canal and the lack of river improvement above Zanesville. The Muskingum Valley is a rich farming country, some coal is mined, and Zanesville is quite a manufacturing place.

Little Kanawha river rises in Upshur county, West Virginia, and empties into the Ohio at Parkersburg, W. Va. It is the only navigable tributary, the improvements of which are not entirely owned by the government. The four locks and dams not owned by the government and the one government lock provide slack-water navigation for 48 miles. The river has

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a length of about 158 miles, and flows through a country rich in coal, timber and oil.

Kanawha river is slack-watered for 90 miles from Point Pleasant, W. Va., where it joins the Ohio, and is the only river in the United States with a complete system of movable dams. There are ten locks, and two fixed and eight movable dams. The upper course of the Kanawha is called the New *which flows* through North Carolina, Virginia, and West Virginia, *giving* the Kanawha a length of 450 miles. During the calendar year 1903 at least 1,506,043 tons of freight was handled, consisting chiefly of coal.

Big Sandy river is formed at Louisa, Ky. (Lawrence county), by the Tug and Levisa forks, and empties into the Ohio at Catlettsburg, Ky. It has a length of 27 miles, which are being slack-watered. The Tug Fork is 160 miles and the Levisa Fork 163½ miles in length, though not provided with locks and dams, open-river navigation is maintained. The country traversed by the Big Sandy and its two forks contains vast quantities of coal, but lack of proper transportation *prevents its* reaching the market.

Kentucky river has its source in Lee county, Kentucky, and extends practically across the state, emptying into the Ohio at Carrollton. It is over 260 miles in length, and navigable to Ford, Ky., a distance of 176 miles. There are eleven locks and dams constructed or constructing. The commerce consists principally of timber.

Green river rises near the middle of the state of Kentucky; in Lincoln county, it is joined by the Barren. In connection with the Barren, slack-water navigation extends to Bowling Green, a distance of about 172 miles from the Ohio, there being six locks and dams. Considerable freight passes down this river each year.

Wabash river is one of the longest branches of the Ohio, having a length of 550 miles. It rises in Mercer county, Ohio, and flows through the state of Indiana. The improvements of this river consist of those necessary for open-river navigation. About 4,370 tons of freight passed the only lock and dam in the river.

Cumberland river rises in the Cumberland mountains, in eastern Kentucky, flows through Kentucky and middle Tennessee, re-enters Kentucky, and empties into the Ohio. The length of the Cumberland is about 688 miles, and it is navigable for about 518 miles.

Tennessee river, formed by the French Broad and Holston near Knoxville, Tennessee, flows southwest in Tennessee, thence west in Alabama, touching the northeast corner of Mississippi, thence north through Tennessee and Kentucky. It is about 652 miles long; including its principal tributaries, it forms a waterway 2,300 miles in length, 1,300 miles of which is capable of being navigated by steamboats.

The above-mentioned rivers are all more or less under improvement by the general government.

Much attention has been given the improvement of the Ohio, and from the many examinations, surveys, and investigations of proposed methods recorded, the improvements should proceed without delay. But new features are constantly being brought forward, and new ideas and requirements advanced, so that today no fixed scheme of improvement is in force.

On Jan. 27, 1817, the general assembly of the state of Ohio by joint resolution requested the states of Pennsylvania, Virginia, Kentucky and Indiana to unite with Ohio in appointing commissioners to examine the Ohio river. Such commissioners were appointed, and submitted a report under date of Nov. 2, 1819. No action was taken however. In 1820, congress provided for a survey from Louisville to Balize (mouth of the Mississippi), which survey was made in 1821. The first appropriation for the improvement of the Ohio was made in 1824, which provided for improving certain sand bars, and removing snags. In 1825, the first dike was begun at Henderson Bar, under the personal direction of Major S. H. Long, topographical engineer. Except the removal of snags, no work of improvement was done above Louisville until 1836, when dams were begun at Browns island. Work toward providing open-river navigation has continued from that year to this, the method employed being the construction of low dams to close unused passages, guide dikes to confine the water to narrower channels, removing obstructions such as snags, wrecks, etc., and dredging.

The canal at Louisville, known as the Louisville & Portland canal, was begun in 1825, and completed in December, 1870. It consisted of a canal 2 miles long and 64 ft. wide, with a flight of three locks at the lower end, each 198 ft. between hollow quoins and 50 ft. wide. Work of enlarging the canal and building larger locks was commenced in 1860. At present the canal is 90 ft. wide, and the two outlet locks, 350 ft. between hollow quoins, and 80 ft. wide. The work was turned over to the United States government on June 10, 1874.

The study of the radical improvement of the Ohio river by locks and dams appears to have been first taken up by the government engineers in 1872; and in 1874 Colonel William E. Merrill, corps of engineers, U. S. A., recommended as the best method for improving the Ohio, at least the upper part of its course, that used so successfully on the Seine, Yonne, Marne, Meuse, and other French rivers (locks and movable dams). The movable dam referred to was the Chanoine of which Colonel Merrill gives the following description:

A Chanoine wicket, when in position, is a solid frame of timber about 3½ ft. wide and 13 ft. high, sloping downstream and supported behind by a heavy iron prop. The horse is hinged to the wicket and to the floor. The prop turns on the upper axle of the horse, as does also the wicket. The latter is not fastened to the floor except by the horse, and can swing around the upper axle of the latter when not held down by the pressure of water. A series of such frames or panels makes the dam.

The props are tripped successively, and the wickets fall into a shallow recess where they are below the reach of passing boats. The river is then in its natural condition, offering no obstacle to boats nor to the passage of floods.

On the strength of the above-mentioned recommendation, the act approved March 3, 1875, contained the following:

For the improvement of the Ohio river, $300,000; that $100,000 of this amount shall be used for and applied toward the construction of a "movable dam," or a dam with adjustable gates, for the purpose of testing substantially the best method of improving permanently the navigation of the Ohio river and its tributaries.

Generally an act of congress is sufficient for work of this character. Not so however with the first step toward the radical improvement of the Ohio. Much time was lost in procuring the land necessary for a lock site. Prices for land were advanced, and the legislature of the state of Pennsylvania delayed passing a bill ceding jurisdiction. Upon a third attempt (in 1875) to have a bill passed ceding jurisdiction, the bill was defeated through the efforts of the coal shippers, who had developed considerable opposition to the construction of locks and dams in the Ohio.

The Pittsburg Coal Exchange and the Steamboatmen's association submitted on Dec. 23, 1875, a memorial to congress against the proposed slackwater system. A board of engineer officers was appointed by a special order from the engineer department to investigate the objections. Among other things the board's report contains the following:

"Though we have no means of estimating this accurately, yet, from data accessible, we doubt if the coal shipped much exceeds 5 per cent, in money value, of all other kinds of freight transported on this river. It would seem, therefore, that the

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coal-transportation entered of Pittsburg is in no way enfitled to dictate the system of improvement for the Ohio to the exclusion of all other interests."

Colonel Merrill stated in his report of June 30, 1876, in regard to the opposition from the coal shippers:

"The truth is, that if the Ohio river were provided with a perpetual 6-ft. navigation, there would be no need for the huge fleets that can only run during a few months in the year, and at other times are tied to the banks. The traffic in coal would become regular and constant. I am far from desiring to do anything that will injure the coal trade, and my record will show that I have worked faithfully to improve the river, and especially its upper portion, so that coal tows might run with more ease and safety; but I recognize the fact that the shipment of coal is not the only nor even the chief commerce on the Ohio river, that, however valuable in its effect on other industries, the total annual value of the coal that descends the Ohio is but $6,000,000, as compared with a general river commerce of about $200,000,000."

This has ever been the state of affairs on the Ohio; there has been no concord in action, in consequence of which the improvement has not received the proper consideration from congress. The river should be improved with the view of benefitting all interests. On March 17, 1877, the Pennsylvania state legislature passed an act ceding jurisdiction over the land which may be purchased for what is now known as Davis Island dam. This was two years after congress provided for the construction of the dam. In other words, it took the state of Pennsylvania fully five years to see the value of a proposed improvement which today is considered invaluable. Actual work of construction on the first lock and movable dam in the Ohio river was commenced on Aug. 19, 1878, Lieut. S. A. Mahan, corps of engineers, U. S. A., in local charge. These structures were completed and opened to the public on Oct. 7, 1885, at a cost of $910,000. Many changes were found necessary and the cost thereby greatly increased. The lock is one of the largest in the United States, being 110 ft. wide and 600 ft. long., inside measurement. An ordinary Ohio river towboat with ten barges and two flats can be passed at one locking, which when loaded with coal is equivalent to over 140,000 bu., or 112 car loads (100,000-lb. capacity) which would require four locomotives in transporting. The navigable pass in the dam, that is, that part of the dam which is passed through when the water in the river is at a boating stage, is 719 ft. in width. This part of the dam consists of a series of Chanoine wickets, and the remainder of a bear trap and a weir of wickets. The bear-trap section is used to pass drift and also to draw down the pool when the wickets of the pass are to be lowered, or to allow the water to flow through when the wickets are to be raised.

Also from an engineering viewpoint, this system of improvement found much opposition in the beginning. No less an engineer than the late Herman Haupt advocated the contraction of the river channel from 300 to 110 ft. with automatic wickets set across the 110-ft. contraction. Mr. Haupt addressed a paper to this effect to congress, which paper was referred to a board of engineer officers for consideration. The board disapproved the scheme. Col. Merrill, who was a member of the board, added the following to the board's report:

"That an increase of depth can be obtained by contraction is an elementary principle in hydraulic engineering that has been employed on the Ohio since Col. Long began work at Henderson bar in 1824. The net gain to navigation is much less than theory would indicate, on account of various causes, chief of which are the injury to the bar next above on account of the local lowering of the water level due to the increased current, and the formation of shoals in the pool below where the scoured material is deposited. The effects cannot be avoided except by simultaneously treating all the bars on the long-length river, and by the addition of works of defense for the banks and bottom that in the aggregate would prove impracticable on our large rivers on account of their excessive cost. I am satisfied that Gen. Haupt's wickets would be a serious injury instead of a benefit to navigation. * * * It must be borne in mind that his wickets cannot be dropped on the bed of the river, like those intended for use at Davis island dam."

To which Mr. Haupt replied:

"The dissimilarity to the Davis island wickets may be an unintended, but it is a high recommendation. * * * I do not wish aggressively to throw the slightest obstacle in the way of the costly experiment Col. Merrill is engineering at Davis island, and refrain from further comment, leaving the demonstration of its success or failure to be given by the logic of results."

The Davis island dam has been in operation almost twenty years, and has proved beyond a doubt its practicability. It has been invaluable to the city of Pittsburg and to coal shippers of the Monongahela. In further proof of the practicability of the movable-dam system, is the use of such dams on the Kanawha river, where eight of such structures, while not so large as the Ohio river dams, are in successful operation.

In addition to the lock and dam at Davis island, similar structures have been in operation near Beaver, Pa., since October of last year; but they are not entirely completed owing to a lack of funds. Locks and dams are constructing near Coraopolis, Sewickley, Glenasborne and Rochester, Pennsylvania; near Wellsville, Brilliant, Marietta, and Cincinnati, O.; and at McMechen, West Virginia. The foregoing covers practically the work accomplished in over thirty years; and if completed, while benefitting local interests, will not improve the general navigation of the river. The appropriations thus far made have been contrary to business principles, and without regard to the reports submitted by the government engineers, as called for by congress.

The river and harbor act of Aug. 11, 1888, provided for a board of engineer officers of the U. S. army, to thoroughly examine the Ohio river below Pittsburg to determine the practicability of its improvement by movable dams. The report submitted by the board contains the following:

"While it may be possible to improve the Ohio river throughout its entire length by means of a slack-water system it does not appear advisable to adopt such a system for the lower portion of the river, at least at the present time. On a large portion of the stream it is most probable that an open-channel improvement will furnish all the relief necessary to the interests of commerce, or all that may be required for many years to come. It would therefor appear desirable that the extending of the system of movable dams, even to the portion of the Ohio to which they are specially adapted, and on which they appear to be a necessity, should be gradual."

Congresses of the past have evidently ignored this report; otherwise instead of having locks and dams in course of construction here and there in a 400-mile stretch, the most troublesome section would see the structures under way. What good to general navigation is a lock and dam below Wheeling, or above Parkersburg, or below Cincinnati, if steamboats cannot get below Beaver, Pa.? Had congress taken a business like view of the matter, today, with no greater expenditure of money, locks and dams would have been well under way from Pittsburg to within thirteen miles of Wheeling, with definite sites for a structure immediately above and another immediately below Wheeling; in other words, providing for navigation for at least two months additional each year.

Boards and commissioners have considered and reported on this proposed improvement and surveys have been made, so

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that today there ought to be sufficient data at hand to decide definitely whether or not the Ohio is worthy the large amount necessary to its radical improvement and what form or method is best adapted for the purpose. Congresses have toyed with this subject for over thirty years, through which the actual work accomplished has been excessive in cost and of little practical benefit. Congress should now turn a deaf ear to all croakers, appoint a board to thoroughly examine into the matter, decide definitely what should be done, and have it done. If it is decided that the Ohio should be improved at the expense of the United States, then let funds be provided, not by inadequate appropriations, but in a thoroughly business like manner.

Past surveys for locating locks and dams show the necessity of thirty-seven such structures between Pittsburg and Cincinnati. A complete lock and dam will cost at least one million dollars; or a total of $37,000,000 to provide six-foot navigation for a distance of 480 miles. In other words, $37,000,000 plus the cost of operating and maintaining will provide continuous navigation over a distance of 480 miles for the largest Ohio river packets, and for towboats with tows aggregating 140,000 bushels of coal each a trip. A part of the thirty-seven millions has already been provided and part of the structures built.

AT THE HEAD OF THE LAKES

Duluth, Minn., April 12.—The first loads of grain from the head of the lakes were on Saturday the 8th, when the J. T. Hutchinson, which had been lying loaded with flax at Duluth during the winter, and the Sultana, which took flax from the Superior Terminal elevator, went out of the harbor. A number of ships have gone to Two Harbors and to the Missabe ore docks at West Duluth to load, and have since left for below. There have been no arrivals and none are expected for a while yet. The ore roads have put on a part of their special ore service, ten trains on the Duluth & Iron Range and five each on the Duluth, Missabe & Northern and the Great Northern. These will be increased as fast as needed, or as fast as ships get here, until the full schedule is in operation. It would be very handy now if there had been more ships wintering at the head of the lake. The Pittsburg Steamship Co.'s barges that have been at the head of the lake all winter have not yet got away.

The first loads of ore have arrived at Ashland and Marquette docks, the latter early last week, the former on Saturday. No ships can get into Ashland for a week or more but Marquette is open.

The number of mines to ship in excess of 1,000,000 tons this year will probably include more than have ever done such a record in past years. The Fayal should ship 2,000,000, and can do so with ease, the Mahoning could, but will not; the Burt will be above 1,000,000, so will the Mountain Iron, the Stevenson and the Adams. The Biwabik has orders for nearly 900,000 tons and can easily ship much more if it is considered desirable. These are all on the Mesabi. On the Gogebic the Norrie group will doubtless make better than 1,000,000 tons and on the Menominee the Chapin will be in the same class. This is about all, though several groups, such as the Cleveland Cliffs Iron Co., will be in that class, figuring their mines lying near each other. These mines above mentioned, million-ton-mines, will doubtless make a contribution to the total that will be more than the total lake shipments in 1895.

Frankfort and Northport have proved failures as summer resorts and during the present season the steamer Manitou will not touch at them. The time table of the Manitou will be completely changed in consequence of the dropping out of these points. She will leave Chicago on Monday, Wednesday and Fridays, instead of Tuesday, Thursday and Saturdays.

BIDS FOR NAVAL SUPPLIES

The bureau of supplies and accounts, navy department, Washington, will receive bids until April 18 for a quantity of supplies for the Portsmouth, Boston, Newport, New York, League Island, Washington and Norfolk navy yards, including motors, rivet forges, heaters, etc. The bureau of yards and docks, navy department, Washington, will soon ask bids for furnishing two traveling cableways for the naval station at Guantanamo, Cuba, for use in excavating for the dry dock to be constructed at that station. Two orders were recently placed with American firms for machinery to be used in digging the Panama canal. The Panama Canal Commission which resigned last week closed a contract with the Ingersoll-Sergeant Drill Co., New York, for fifty standard rock drills. The machines are to be used in the removal of rock in the great Culebra cut through the crest of the isthmus. The commission also authorized the Ingersoll-Sergeant Co. to remodel a large number of the French-Ingersoll drills already in use at the canal operations. These machines were built in France under the patents of the American manufacturer and they remain from the equipment of the French company, whose operations on the canal ended so dismally.

The Rand Drill Co., New York, has received an order for fifty drills, complete with mounting and equipments, to be delivered as early as possible. It is said in the trade that the new commission will place orders for nearly 1,000 drills with American manufacturers during the coming summer, as it is declared that fully that many will be required to cut through the rock formation at the crest of the isthmus.

All bids opened by the Isthmian Canal Commission on Feb. 28 for twenty-five rock drills have been rejected. It is probable that new bids will be called for under another date under revised specifications.

The following bids were opened March 25 for a 20-ton four motor electric traveling crane for the Portsmouth navy yard: The Morgan Engineering Co., Alliance, Ohio, item 1, $5,325; The Wellman-Seaver-Morgan Co., Cleveland, item 1, $6,840; The North Penn Iron Co., Philadelphia, Pa., item 1, $4,120; Northern Engineering Works, Detroit, Mich., item 1, $5,925; 2, $5,100; Manning, Maxwell & Moore, New York, item 1, $5,212; Pawling & Harnischfeger, Milwaukee, Wis., item 1, $4,650; Cleveland Crane & Car Co., Wickliffe, Ohio, item 1, $6,100; 2, $4,950; Whiting Foundry Equipment Co., Harvey, Ill., item 1, $4,890; The Case Mfg. Co., Columbus, Ohio, item 1, $4,450; Niles-Bement-Pond Co., New York, item 1, $6,060; 2, $5,000.

The following bids were opened March 28 for supplies for the Mare Island navy yard: Bidder 30, Cleveland Punch & Shear Works, Cleveland, Ohio; 36, Ely Machinery Co., San Francisco, Cal.; 54, Harron, Rickard & McCone, San Francisco, Cal.; 56, Henshaw-Bulkley Co., San Francisco, Cal.; 85, Niles-Bement-Pond Co., New York; 87, New Duty Mfg. Co., Janesville, Wis.; 92, Henry Pels & Co., New York; 112, Tatum & Bowen, San Francisco, Cal.

Class 10. One 14-in. sand belt machine, motor driven—Bidder 56, $630.

Class 11. Three Universal tilting table arbor saw benches, motor driven—Bidder 36, $1,494; 54, $2,292; 112, $1,785.

Class 12. One double ended punch—Bidder 30, $2,705; 54, $3,619; 56, $3,270 and $3,320; 85, $4,200; 87, $3,900; 92, $3,100; 112, $3,153.40.

Under bids opened March 14 for machine tools for the various navy yards, under schedule 84, the J. A. Fay & Egan Co., Cincinnati, O., has been awarded class 3, one power feed rod machine, $250; Drew Machinery Agency, Manchester, N. H., class 4, one wood lathe, $94.50.

Mr. N. J. Lynn of Bay City has purchased Capt. Ben. Hotell's interest in the steamer Lizzie Madden.

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LIVERPOOL SHIPPING LETTER

Liverpool, April 1.—On the question of seamen's advances under the United States regulations, the British Shipping Federation have issued a circular calling attention to the present state of the law of the United States of America relating to the engagement of seamen. The points given to the circular may be thus summarised: (1). An act of congress dated 1898 made it unlawful to pay any seaman wages in advance or to pay his wages to any other person in advance; (2). In evasion of this section a plan has usually been adopted signing the seamen at the rate of one shilling a day for 45 days, and $30 per month thereafter, the difference between the one shilling and $30 representing the amount of the advance made to the seamen; (3). Recently, in the case of a claim by the crew of the British barque Eudora for the difference between one shilling and $30, a sum which they had actually been paid in advance, the supreme court of the United States decided that by law, the men were entitled to be paid this amount over again. This would seem to quite upset the one shilling and $30 arrangement; (4). In the opinion of a competent legal authority in the United States the above-mentioned decision does not touch the law making it legal to stipulate in the articles for an allotment for the benefit of a seaman of an amount not exceeding one month's wages to an original creditor of the seaman, in liquidation of any just debt for board or clothing contracted prior to engagement. It is suggested, therefore, that results approximating to the current practice will be attained if masters are instructed to ascertain from seamen when engaging them the name of the creditor (if any) to whom they wish an allotment to be paid, and the nature of the debt which is to be liquidated. It is understood that in certain ports consuls are already prepared to add such particulars to the articles.

The new Allan turbine liner, Victorian sailed from Liverpool on Thursday for Halifax and St. John with 1,500 passengers of all classes. A good deal of interest centered in the maiden voyage of the steamer, which is the first turbine fitted liner to cross the Atlantic. Among those assembled on the landing stage to witness her departure were a large number of well known people, including many representatives of other steamship lines. A striking difference is presented between the engine room of the Victorian and that of any other large steamship propelled by reciprocating engines. In place of cylinders, piston rods and cranks, one sees only the upper halves of three huge horizontal iron cylinders. All the old associations of engine-throbbing have disappeared under the turbine system, and passengers will find a most pleasant as well as strange experience under this up-to-date method of propulsion. One can hardly speak too highly of the general and luxurious arrangements of the new vessel, which proceeded to Canada under glorious and most promising auspices. It is worthy of notice that the Victorian, while embodying the very latest ideas in machinery, wireless installation, internal fittings, and general equipment, employs wood throughout for her mainmast and rope rigging to keep it in position, an idea followed by the Allan Line in all its ships. This is because of deviation, for the standard compass is placed at the mainmast head, where no iron or steel whatever is used either for caps, blocks, bolts, crossties, or any other fitting, so that, so far as possible, the compass is undisturbed by local magnetic influences. The Allan second turbine steamer, Virginian, built on the Clyde, has commenced a series of trials preparatory to delivery by the builders, and sailing in the same service from Liverpool on April 6.

A Glasgow shipping correspondent says that although the Clyde-built Virginian is a sister ship to the Belfast-built Victorian, it does not follow that the two vessels are alike in every detail. They are of the same general dimensions, and are, as a naval architect would say, built to the same coefficient, but each firm of builders has been allowed by the Allan Line sufficient scope to show its individual ability in designing and especially in internal fitting out. In consequence the successful trials of the Victorian do not detract from the interest of the trials of the Virginian. The latter vessel is, no doubt, somewhat different in form, and she certainly differs in boiler power and in some of the designing of the machinery. The boiler power is slightly less than that of the Victorian, so that if Messrs. Stephen obtain 19½ knots as Messrs. Workman, Clark & Co. did, it will be all the more to their credit. In the passenger accommodation, the chief differences are in the furnishing of the cabins and in the first-class saloon. Outwardly the chief difference between the Victorian and the Virginian is in the funnel. In the former the funnel is octave, and in the latter it is circular.

The barque Francois which left San Francisco Sept. 5 last, and which has been the subject of considerable speculation in the overdue market, arriving in the Mersey, Liverpool, on Friday. She is a French owned vessel, belonging to Messrs. Ehrenberg of Havre, and was long overdue at Liverpool, her port of destination. She has a valuable cargo of grain on board. As much as 99 guineas premium was paid on her before March 10 when she was sighted by an English steamer in lat. 37, long. 36 west, and then the premium went down to 6 guineas, but subsequently rose to 70 guineas, the prevailing idea being that the report was not reliable. The vessel has had an extraordinary long voyage, taking about six and a half months to accomplish her journey. She is said to be in fine condition notwithstanding the stormy weather that has recently prevailed. The long journey from San Francisco is considered to be one of the most extraordinary on record.

The Tyne correspondent of the Shipping Gazette says that there will shortly be more cargoes of Cleveland iron crossing the Atlantic, for in addition to the 10,000 tons of spiegel iron booked early in the year from the United States, and since shipped, a second order for a like amount has just been received, and a third is said to be inquiring in the market. Japan, too, continues to be a good customer for British pig iron, shipments to that country going steadily forward. The correspondent is of opinion that the Cleveland iron market is in a position to stand any amount of extra demand, for exceptionally heavy stocks have accumulated during the winter, and until these are reduced considerably below their present figure, prices are not likely to rise much above their present comparatively low level. But with the opening of the spring navigation, there ought to be larger shipments of pig iron all round.

The Fairfield Ship Building & Engineering Co., Ltd., on Wednesday launched from their yard at Govan, the Furst Bismarck, a twin screw steamer of 8,300 tons built to the order of the Hamburg-American Line. The new vessel is 486 ft. long by 55 ft. by 33 ft., and will carry 233 first-class, 40 second-class, and 1,324 steerage passengers, together with a crew of 200. The Furst Bismarck is qualified for participation in all the varied trades in which the Hamburg-American company take part, and her size will enable her to take an important place in the big German fleet. The feature of the vessel is that she will be fitted as a floating sanitarium, with a large gymnasium on the boat deck. She will also have an installation of medico-electrical appliances, and an installation for the reception and despatch of marconigrams.

Two other notable launches this week are the Zent and Pacuare by Messrs. Workman, Clark & Co., Belfast, for Messrs. Elders and Fyffes Shipping Ltd. These vessels have been specially designed and equipped for the conveyance of fruit in bulk betwen the West Indies, Costa Rica and Britain. Each has a gross tonnage of nearly 4,000 tons, and the insulated holds will be capable of storing at least 50,000 bunches

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of bananas, besides large consignments of oranges and limes as well as general cargo.

A further launch calling for notice is that of the battleship Kashima for the imperial Japanese navy by Messrs. Armstrong, Whitworth & Co. Several hundreds of visitors were present from London, amongst them being Viscount Hayasti, Japanese minister in London, and many members of the *legation.* The Kashima is in displacement, armament, and *dimensions*, the most powerful battleship that Messrs. Armstrong, Whitworth & Co. have built. She is one of two new vessels ordered by the Japanese government from British firms, the sister vessel being constructed at Barrow. Her principal dimensions are as follows: Length, 425 ft., breadth, 76 ft. 7½ in., displacement, 16,400 tons. Her indicated horse power is 15,600, and her estimated speed will be 18½ knots. She will carry a normal coal supply of 750 tons, with a bunkering capacity of 2,150 tons. She is to have four 12-in. and four 10-in. breech-loading guns, twelve 6-in. quick-firing guns, and twelve 12-pounder and three 3-pounder quick-firing *guns.* There will in addition be six Maxims and five 18-in. *submerged* torpedo tubes. She is described by the builders as one of the largest and most powerful battleships yet constructed. Speaking to one of the toasts, Capt. Iwamoto said that the vessel's guns could throw an effective weight of eleven tons of steel per minute. The Elswick yard this year attains its majority, and during the twenty-one years since 1884 the firm have launched seventy-three war vessels for fifteen different navies—twenty-one for the British government, fourteen for the Japanese, seven for the Chilians, five for the Brazilians, five for the Chinese, four for the Norwegians, four for the Italians, three for the Argentines, two for Austria, two for Spain, two for the Indian service, two for the United States, one for Portugal, and one for Turkey. The aggregate displacement was about 296,000 tons, and the horse power about 672,000.

LAUNCH OF BATTLESHIP MINNESOTA

The battleship Minnesota was successfully launched at the yard of the Newport News Ship Building & Dry Dock Co. last week, and was christened by Miss Rose Marie Schaller, daughter of State Senator Schaller of Hasting, Minn. Her maids of honor were Miss Constance Day of Fairmount and Miss Lillian MacMillan of Minneapolis. Governor Johnson was unable to attend and was represented officially by his private secretary, Mr. Frank A. Day. The Minnesota legislature was represented by Senators Lowell C. Jepson of Minneapolis, W. A. Smith of Windom, Representatives R. T. Lewis of Duluth, James E. Dorsey of Glencoe and A. N. Hayes of Hastings. Among the distinguished visitors in attendance were Assistant Secretary to the Navy Darling, Rear Admiral Harrington, commandant of the yard of Portsmouth, Governor I. J. Montague of Virginia, Senator Thomas Martin and Lieutenant Governor Wolford. At the luncheon following the launch addresses were made by Governor Montague, Assistant Secretary Darling, Senator Schaller and Mr. Frank A. Day. The leading features of the Minnesota are:

Length of load water line, 450 ft.; breadth, extreme, at load water line, 76 10-12 ft.; displacement on trial, not more than, 16,000 tons; mean draught to bottom of keel at trial displacement, 24½ ft.; gross draught, full load, 26¾ ft.; total bunkering capacity, 2,000 tons.

The main battery will consist of four 12-in. breech-loading rifles, eight 8-in. breech-loading rifles, twelve 7-in. breech-loading rifles. The secondary battery is to be composed of twenty 3-in. 14-pounder rapid-fire guns; twelve 3-pounder semi-automatic guns; six 1-pounder automatic guns; two 1-pounder semi-automatic guns; two 3-in. field pieces; two machine guns, caliber 30; six automatic guns, caliber 30. The battery will be mounted as follows: The 12-in. guns in pairs in two electrically controlled, balanced, elliptical turrets on the center line, one forward and one aft and each with an arc of fire of about 270 degrees. The 8-in. guns in pairs, in four electrically controlled, balanced elliptical turrets, two on each beam, at each end of the superstructure. The 7-in. guns in broadside on pedestal mounts on the gun deck behind 7-in armor, each gun being isolated by splinter bulkheads of nickel-steel of from 1½ to 2 in. thickness; forward and after guns arranged to fire straight ahead and straight astern, respectively. Other 7-in. guns to have the broadside train. All the 7-in. guns are so arranged that their muzzles train inside the line of the side armor, thus leaving a clear and unobstructed side when it is desired to go alongside a pier or vessel. Arrangements will be made whereby the 3-in. guns on the main deck can be quickly and conveniently dismounted, housed and secured. The hull is protected at the water line by a complete belt of armor 9 ft. 3 in. wide, having a maximum thickness of 11 in. for about 200 ft. amidships. Forward and aft of this maximum thickness is 9 in. within the limits of the magazines, from which points the thickness is gradually decreased to 4 in. at the stem and stern. The lower casement armor extends to the limits of the magazine spaces and reaches from the top of the water-line belt to the lower edge of the 1-in. gun ports on the main deck, and is 6 in. in thickness, the athwartship bulkheads at the ends of this casement also being 6 in. thick. The casemate armor around the 7-in. guns on the gun deck is 7 in. thick and the splinter bulkheads are from 1½ to 2 in. The protection of the 3-in. guns is nickel-steel 2 in. thick.

The upper casemate athwartship armor, extending from the shell plating to the 12-in. barbettes, is to be 7 in. thick throughout.

The 12-in. barbette extends from the protective deck about 4 ft. above the main deck and consists of 10 in. of armor in front and 7½ in. in the rear above the gun deck. Between the two there will be a uniform thickness of 6 in. The barbettes will not have any special framing, the connection of the armor to the decks being deemed sufficient. The 8-in. barbettes will be 6 in. thick in front and 4 in. thick in the rear, with the upper tube 3¾ in. and the lower 3 in. thick. The 8-in. turrets front plate will be 6½ in., the rear plate 6 in. and the top plates 2 in. thick. The conning tower and shield will each be 9 in. thick, and the signal tower 6 in. An armor tube 36 in. in diameter will extend from the base of the conning tower to the protective deck, and will be 6 in. thick throughout. Teak backing of a minimum thickness of 3 in. will be fitted behind all side athwartship, and 12-in turret armor, 2 in. of backing to be fitted behind the 8-in. turret armor. Other armor will be fitted without backing.

The ammunition for the 7-in. and smaller guns will be conveyed by hoists directly from the ammunition rooms by ammunition passages to the deck on which it is required, or as near that as possible. These hoists will be driven at constant speed by an electric motor, and will be arranged to deliver seven pieces per hoist per minute. The turret guns have regular ammunition hoists leading directly from the handling rooms or the ammunition passages to the turrets. For transporting 12-in, 8-in. and 7-in. ammunition trolleys and tracks will be fitted in handling rooms, passages and shell rooms.

The engines will be of the vertical twin-screw, four-cylinder, triple-expansion type of a combined indicated horse power of 16,550. The steam pressure will be 250 lbs. The stroke will be 4 ft. The ratio of high pressure to low pressure cylinder will be at least 1 to 7, and the diameters will be sufficient for the required indicated horse power at about 120 revolutions per minute. Each engine will be located in a separate watertight compartment. There will be twelve boilers of the Babcock & Wilcox type placed in six watertight compartments.

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AROUND THE GREAT LAKES

The Marigold replaced the lightship at Corsica last week.

The Steel Corporation is equipping the King rigs at Conneaut with two-ton clam shell buckets.

John Prindiville & Son will move from 12 Sherman street to the fourth floor of the Gath building, Chicago.

The old Lynn Ranges at Fort Gratiot and the ranges at Point Edwards have been lighted for the season.

The steamer Frank E. Kirby operated by Ashley & Dustin resumed her route between Detroit and Sandusky.

Mr. Arthur Helm will remove from the Board of Trade building to the second floor of the Rialto building, Chicago.

The steamer Imperial was placed in dry dock at the plant of the Port Huron Ship Building Co., Port Huron, last Friday.

Capt. John Mason, keeper of the Colchester reef light, has received orders from Washington to put his light in operation.

The laborers at the Lorain plant of the American Ship Building Co. struck last week for a 10 per cent increase in wages.

The schooner Kelderhouse, which was wrecked at Alpena last fall, is being rebuilt at Sarnia. The Reid Wrecking Co. purchased her.

The Ogdensburg Coal & Towing Co., Ogdensburg, N. Y., has purchased the steamer Denver for the coal trade between Oswego and Montreal.

All lightships, gas buoys and markers are in position in the Detroit river, Lake St. Clair and St. Clair river and keepers are on the range lights.

Capt. Charles E. Moody has given up the command of the steamer F. & P. M. No. 4. Capt. Moody will again sail the whaleback Christopher Columbus.

James A. Calbick & Co., Chicago, Ill., vessel agents, will remove their present offices at No. 12 Sherman street to 2 and 4 Sherman street, rooms 44 and 45, on May 1.

E. T. Williams & Co. of Duluth will have about nine dredges running this year, about half at the head of the lakes and the rest on contracts they have taken elsewhere.

Capt. M. Swain of Detroit has been appointed chief wrecking master for the Great Lakes Towing Co. He will be stationed at Cheboygan with the wrecker Favorite.

The passenger steamer Lincoln which is operated between Windsor, Amherstburg and Pelee Island was destroyed by fire while lying at King's dock, Sandwich, last week.

The steamer Monroe C. Smith, which left Buffalo with coal, struck some floating obstruction in Lake Erie and reached Detroit with the plates in her stem badly bent and buckled.

E. J. Fleming & Co., vessel agents, have given notice that their offices will be removed from 2 and 4 Sherman street to rooms 24 and 25, No. 6 Sherman street, Chicago, about May 1.

The Lake Transit Co. with headquarters at Duluth will operate the boats of the Eddy steam fleet. Capt. Howard S. Shaw is manager of the new company and Mr. G. A. Tomlinson is secretary.

Hugo & Tims of Duluth have contracted for the steamer H. A. Root for their Sand Beach, Mich., contracts with the government. The boat will be overhauled and so changed that she will make a handy gravel carrier.

The tugs Prodigy and Goulder have been assigned to Lorain. The Goulder will be in charge of Capt. Brown and Engineer Cain of Cleveland. The Prodigy will be in charge of Capt. McCray of Cleveland and Engineer Bowen of Lorain.

The new Lake Superior division of the Graham & Morton Line will begin business April 22 with the sailing of the steamer Puritan for Hancock and Houghton. Stops will be made at Milwaukee, Mackinac Island, Sault Ste. Marie and Marquette.

The Detroit & Cleveland Navigation Co. will open its upshore service this week with the City of Alpena. The State of Ohio will open the route between Toledo and Cleveland on April 17 and the Eastern States will open the Buffalo route on April 19.

During a period of ten minutes on the morning of April 9 the water in Waukegan harbor fell nearly 3 ft. and as suddenly returned to its former level. Such incidents have happened before, but Harbor Master Kennedy recalls none so pronounced as this.

It is understood that negotiations are pending for the purchase of the Bertram Engine Works Co., Toronto, Ont., by the Canadian Ship Building Co. The Canadian Ship Building Co. has lately secured a contract to build a steamer for the Niagara Navigation Co.

The passenger steamer Majestic of the Northern Navigation Co.'s fleet will be operated on the Georgian Bay route during the present season, stopping at Cleveland, Sandusky, Toledo, Detroit, Windsor, Sarnia, Goderich, Killarney and passing through Georgian Bay from Sault Ste. Marie.

The steamers H. B. Hawgood and Wisconsin of the Hawgood fleet left Buffalo with coal cargoes for Milwaukee. When the boats were out about three hours Chief Engineer Samuel Rosswell of the Hawgood was injured and the steamer returned to Buffalo. Mr. Rosswell was taken to the hospital.

The tug Welcome which has been lying for the past three years on the river bank at Lorain and which was discarded by the Great Lakes Towing Co. has been purchased by the L. P. & J. A. Smith Co. and is now in the dry dock at Lorain. She will be taken to Cleveland and new machinery installed in her.

Capt. John J. Boland and Charles Keenan of Buffalo, owners of the lumber schooner Massasoit, which was wrecked last fall in the water works intake on the Niagara river, have filed a libel against the steamer Oceanica for $25,000 damages for loss of the boat cargo. The Massasoit was in tow of the Oceanica when she went on the pier.

As soon as the Corey is off the stocks of the South Chicago yard of the American Ship Building Co. extensive alterations will be made in the shipyard, in order to make it one of the most complete yards on the great lakes. Some of the slips will be filled in and others built in order to give ample facilities for the construction of the largest sized ship.

The steamer George B. Leonard of the United States Transportation Co.'s fleet which left Buffalo Monday with a cargo of coal was forced to put in Cleveland on Tuesday evening leaking badly. The steamer encountered very heavy ice about 25 miles west of Long Point and caused the seams in her bow to open up. Temporary repairs were made on the Leonard at Cleveland.

Representatives of the Great Lakes Towing Co. and the Licensed Tugmen's Protective association have agreed upon wages for the coming season as follows: At all Lake Erie ports, captains will be paid $131.25 per month, engineers $116.29; at Chicago, captains $161.29, engineers $116.29; South Chicago, captains $141.29, engineers $116.29; at Duluth, captains $136.00, engineers $116.29.

During the present week vesselmen have been much mystified by the reports concerning the condition of ice in the rivers and at the various harbors. The reports speak of candled ice and many inquiries were accordingly made as to what manner of ice that is. The weather bureau, under whose direction the reports were formulated, was unable to state the meaning and the government engineers added that in all their experience they have never heard of it.

Mr. D. C. McIntyre, general freight and traffic manager of the Detroit & Buffalo steamers, has concluded negotiations with the Wabash system whereby the steamers will get all of the east and west bound tonnage of the Wabash. By this new arrangement all through freight from the St. Louis district which heretofore went to Toledo by rail and was there shipped by boat to Buffalo will no longer go to Toledo but will go

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to Detroit and thence east by way of Detroit and Buffalo steamers.

Mr. W. C. McMillan, Mr. A. A. Schantz and Mr. D. C. McIntyre of the Detroit & Cleveland Navigation Co. visited Bay City last week to investigate the possibilities of establishing a steamship service between Bay City and Detroit. They were met by representatives of the Board of Trade of Bay City and also by a delegation of shippers who pledged their support to the enterprise. While no decision was reached it is understood that the company was favorably impressed with the outlook.

Through the efforts of the Hon. Peter White of Marquette, Mich., and Col. Charles T. Harvey of Ottawa, Canada, the Michigan senate has passed an act to appropriate $15,000 to be used in celebrating the fiftieth anniversary of the completion of the Sault Ste. Marie canal. While the bill has not yet passed the house there is every reason to believe that it will. This is additional to the $10,000 appropriation received from congress and is sufficient to insure a celebration worthy of the occasion. Undoubtedly the vessel interests of the lakes will do their part.

Commodore George Worthington's sail yacht Priscilla was placed in one of the sections of the floating dry dock at the plant of the Great Lakes Engineering Works, Detroit, last week. A Craig gasoline engine of 75 H. P. will be installed in the Priscilla and the wheel will be so contrived as not to interfere with the operation of the ship when it is desired to use sails only. The Priscilla will be in dry dock for about three weeks. She is the first vessel to be placed in this section of the dock and the experiment of operating the section was most satisfactory.

The Lake Michigan & Lake Superior Transportation Co. of which Capt. W. H. Singer is president has issued an announcement to the effect that pending the construction of its new equipment the company has suspended active operations and for the present a portion of its territory in the Lake Superior district will be served from Chicago and Milwaukee by the Graham & Morton Transportation Co. It is understood that the Lake Michigan & Lake Superior Transportation Co. is contemplating the construction of two new modern fast freight and passenger steamers to ply between Duluth and Chicago. The Graham & Morton Line has hitherto confined its operations to Lake Michigan and it is therefore interesting to note that they are to run their vessels to Lake Superior this year.

PERSONAL

A. B. Canaga, of the bureau of steam engineering of the navy department has gone to Halifax, where, by direction of the navy department, he will go aboard the Victorian, which is equipped with turbine engines, and make a trip across the Atlantic on that vessel to observe the workings of the turbine system. He will return to the United States by the Victorian or by her sister ship, the Virginian. The navy department, in asking bids for the scout ships, has announced that proposals for turbine installation will be considered, and has gathered all possible information on turbines.

S. S. Eveland, vice president and general manager of the Standard Roller Bearing Co., 48th street and Girard avenue, Philadelphia, Pa., has just purchased the steel ball business of the Federal Manufacturing Co. of Cleveland. Mr. Thomas J. Heller who represented the Federal Manufacturing Co. in New York will have charge of the eastern business and Mr. F. M. Germaine who had charge of the western territory for the Federal Manufacturing Co. will be western sales manager.

Augustus A. Schantz, superintendent and general passenger traffic manager of the Detroit and Cleveland, Detroit and Buffalo and Cleveland and Toledo lines, celebrated his forty-fourth birthday last week. His friends presented him with a basket of roses and lillies and suspending from the handle were three photographs showing him at four, eleven and forty-four.

Capt. Worth G. Ross who is very well known on the great lakes has been selected by Secretary Shaw of the treasury department for the important position of chief of the revenue cutter service, succeeding Capt. C. F. Shoemaker who will retire in October by reason of age.

Charles M. Eddy, secretary and treasurer, Dearborn Drug & Chemical Co., Chicago, has left on a long vacation to be spent in the Hawaiian Islands. Before sailing from San Francisco, Mr. Eddy will visit all the branch offices of his company in the Western states.

Lieut. Col. Wm. H. Bixby, formerly United States engineer with headquarters at Detroit has been appointed to relieve Col. Oswald H. Ernst at Chicago. Col. Ernst has been appointed member of the Isthmian Canal Commission.

Mr. David C. Reid has resigned the presidency of the Harlan & Hollingsworth Co., Wilmington, Del., and has been succeeded by Mr. Wm. G. Coxe formerly of Cramp's.

C. E. Walker, formerly manager of the railroad department of the Chicago Pneumatic Tool Co., has been appointed assistant to the vice president of the company.

Capt. Alfred Mitchell of Mitchell & Co., Cleveland, who has been in Florida and Cuba for the past six weeks has returned home.

Mr. George Uhler, supervising inspector general of the steamboat inspection service, was in the great lakes district last week.

Mr. Al Easton of Detroit has been appointed to succeed Harvey L. Jester as the Detroit agent of the Lake Seamen's union.

T. T. Lyman has been appointed the general sales manager of the H. W. Johns-Manville Co., 100 William street, New York.

L. A. Haydorn has been appointed traveling freight agent of the Anchor Line at Cleveland.

MR. ROMAN SMITH

In this photograph many of those connected with the lake freight trade will recognize the genial countenance of Roman Smith, the well known culinary artist in the employ of the Pittsburg Steamship Co. "Rome" says that cooking is a pleasure and that he can satisfy the most fastidious, is a fact that he has long since demonstrated. He takes great pride in maintaining the enviable reputation which long years of experience and hard work have won for him. Mr. Smith has been awarded the position of chief steward on the new steamer William E. Corey, now building for the Pittsburg Steamship Co.

MR. ROMAN SMITH.

The Detroit Ship Building Co. will make extensive repairs to the Michigan Central's car ferry steamer Transfer.

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PROBLEMS OF BUFFALO HARBOR

Buffalo, April 10—This generation has a lot of problems to solve of its own making. It would seem as though there ought to be difficulties enough coming up that must be met anyhow, but we see them all and go them a large one better by our own rushing way of doing things. Our lake men have not yet got over being sore over the time they lately had in getting the belated grain fleet tied up for winter and they look for something of the sort or worse right along every December. One of the leading vessel agents said the other day that if we had not had a harbor master with the information and nerve up to the highest standard there would never have been any head nor tail to the tangle down to this day.

Well, what are we going to do about it? Our people say that it takes only three 500-ft. vessels to make a jam in the inner harbor any time and they are about ready to give it up for the present, not the handling of these monsters in some fashion, but any solution of the problem that is anything more than a daily cut and try till the thing is accomplished. I find that there is a pretty general disposition to steer clear of the inner harbor and build all permanent improvements out on the lake front or anywhere else that is easy to get at from the lake. It sounds easy and it can be done comparatively easy, but it would not be very hard to show that it is not the best thing possible, at least in a port that has as good an inner harbor as Buffalo.

It is sometimes thought too bad that all of our lake ports are not right on the edge of deep water like Toronto, but I am more than persuaded that even Toronto would be glad of an estuary leading well into some part of the city that would answer for the greater part of the safe harbor. Buffalo has some miles of it and has built some miles more of it on an independent plan. She is now engaged in a sort of set-to over the proposition to add a mile or two more under the convenient name of flood abatement. At least some of the marine men favor it, sometimes without seeing the inconsistency of also advocating the improvement of the outer harbor as a measure for taking care of the shipping. The real trouble with us, as with all the larger ports, is that we have suddenly found that there is more tonnage than can be well taken care of in winter. Shall we leave it outside or would it be better to add to the inside accommodation?

After looking the matter over considerably it seems to me that the inner-harbor idea has the most in its favor, provided there is plenty of room for the improvement at moderate cost. Not so long ago the really all-round inner harbor of Buffalo did not extend above the Hamburg turnpike. Then the Tifft Farm canals were opened and later on the improvement of the channel of Buffalo creek was carried beyond the turnpike bridge, so that with what is now arranged to be done there a large addition to that side of the inner harbor will soon be made. What has happened in consequence? First there was an improvement of the iron works, long idle. Then there was a big steel elevator built there. Last month a big malt house with a 2,500,000-bu. elevator was located there and now comes the announcement that the old Delaware & Hudson coal-trestle property has been sold for about a million dollars, all right in the territory made navigable above the turnpike bridge.

With the "Hell-Gate" rocks, as they used to be called, still in that channel just above the bridge and vessels always getting fast on them, what would that territory be worth today, compared with what it is actually worth? Yet we all remember that there were wars in the city council and complainings outside of it when the money was voted for digging out those rocks. I am not bringing up this case for the sake of exploiting Buffalo harbor in any special way, but to show that it is never the thing to despise the inner harbor of a city that is a natural outlet to lake commerce and when it is thrown away for something on the lake front merely, with only one side to it and usually hard to reach, a mistake is made. It is possible that both are needed, but the inner harbor must be always the more valuable if it is good for anything, for it means always two miles to one on the open lake and it means the attraction of many industries that do not care to be so entirely marine in character as to choose the open lake front.

What ought to be done to solve the problem of handling 500-ft. vessels in river channels is to provide good winding places at points most suitable. At one time there was some serious thought of scooping out the little island in the harbor opposite the foot of Main street, making a little bay, but the difficulty is that it is too near the outer harbor and would prove a costly convenience. It is often hard to make internal navigation systems what they should be, but they are great helps to a city outside of the mere marine needs and should be made the most of.

APPOINTMENTS OF MASTERS AND ENGINEERS

Shannon & Garey, Saginaw, Mich.: Steamers—Robert Holland, Capt. W. P. Rattray, Engineer Jake Oscar; Homer Warren, Capt. Charles Rattray, Engineer L. Van Liew. Barges—Exile, Capt. John H. Trudo; White & Truant, Capt. James Hall; Ada Keith, Capt. Robert Rabideau; Wm. Crosthwaite, Capt. John Mathison; T. G. Lester, Capt. Thomas B. Garey; T. H. Cahoon, Capt. Charles E. Garey.

Thompson, R. P., Port Huron, Mich.: Tugs—W. B. Castle, Capt. H. J. Bonnah, Engineer L. C. Purdy; A. B. Watson, Capt. R. P. Thompson, Engineer Edward Gripton; George R Hand, Capt. ———, Engineer George Lenox; George W Sigison, Capt. B. Biddlecomb, Engineer Ben Bray. Barge—Kaal Kabin, Capt. Ed. Phillips.

Boland & Co., John J., Buffalo, N. Y.: Steamers—Eber Ward, Capt. A. B. Slyfield, Engineer A. Schnell; George Pridgeon, Capt. John O'Hagan; Alcona, Capt. John Heine, Engineer James Countryman: Schooners—Alta, Capt. James Carr; John W. Nicol, Capt. M. Peterson, Engineer George Haig; Winnipeg, Capt. Wm. Haynes, Engineer Lawrence Brown: Barges—J. I. Case, Capt. A. Mills; F. L. Ewen, Capt Hugh O'Hagan.

Smith, Frank W., Milwaukee, Wis.; Steamers—E. M. Peck, Capt. A. C. Callam, Engineer Harold Stokke; Topeka, Capt. T. E. Clark, Engineer R. S. Mott; Pueblo, Capt. T. W. Lawler, Engineer Wm. Risch; Denver, Capt. F. Brown, Engineer John Smith; Omaha, Capt. ———, Engineer R. Elhaumer; Mary H. Boyce, Capt. John D. Wanwig, Engineer H. Stedman.

McMorran, Henry, Port Huron, Mich.: Steamers—Pawnee, Capt. George Tremble, Engineer ———; Gogebic, Capt James S. Neal, Engineer Ed. Mehner; Britannic, Capt. E. H. Davis, Engineer ———. Schooners—Checota, Capt. H. S. Hughes; Wm. A. Young, Capt. S. Armstrong; J. R. Edwards, Capt H. Spalding; M. E. Orton, Capt. Ed. Henry.

Niagara River Day Line, Toronto, Ont.: Steamers—Chippewa, Capt. John McGriffin, Engineer George M. Arnold; Corona, Capt. Harvey Holmes, Engineer A. J. Woodward; Chicora, Capt. Robert Clapp, Engineer H. Parker; Ongiara, Capt. Hugh McIntyre, Engineer Charles Merriam.

Lake Erie Transportation Co., Cleveland, O.: Steamers—Wm. S. Mack, Capt. C. A. Benham, Engineer T. J. Blain; P. P. Pratt, Capt. T. A. McDougall, Engineer A. C Ferguson. Schooner—Athens, Capt. W. M. Woodward.

Lake Shore Saw Mill & Lumber Co., and The Cleveland Transportation Co., Cleveland, O.: Steamer—E. A. Shores, Jr., Capt. George F. Forrest, Engineer ———. Schooner—Kingfisher, Capt. Wm. Sommerville.

Port Huron & Duluth Steamship Co., C. O. Duncan, T. M., Port Huron, Mich.: Steamers—Wyoming, Capt. C. McLean, Engineer George M. Bohnert; Russia, Capt. Alex. McCowan, Engineer Wm. Brown.

Brittain, R. C., Saugatuck, Mich: Steamers—J. S. Crouse.

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Capt. L. S. Brittain, Engineer S. J. Johns; Frank Woods, Capt. Charles Coates, Engineer H. Randall. Barge—L. Carter, Capt. Wm. Seli.

Lake Erie Transportation Co., Toledo, O.: Steamers—George J. Gould, Capt. Walter M. Cottrell, Engineer George A. Butler; S. C. Reynolds, Capt. T. C. Herrick, Engineer James H. Miller.

Maddigan, James A., Buffalo, N. Y.: Steamer—Canisteo, *Capt. James* A. Maddigan, Engineer James Smith. Schooners—A. A. Carpenter, Capt. Fred Watson; Myron Butman, Capt. John Burke.

Prindeville & Son, John, Chicago, Ill.: Steamers—Winnebago, Capt. T. J. Moran, Engineer Fred Otto; Jessie Spaulding, Capt. James Travis, Engineer Thomas H. Ward.

Houghton, H., Detroit, Mich.: Steamers—H. Houghton, Capt. W. G. Deeg, Engineer ——; Mary, Capt. Louis Allor, Engineer Asal Grooms.

Manistee Lumber Co., Manistee, Mich.: Steamer—Robert C. Wente, Capt. August E. Anderson, Engineer Herman *Winckler*.

South Side Lumber Co., Chicago, Ill.: Steamer—Philetus Sawyer, Capt. J. F. Higgie, Engineer George Quackenbush.

Stewart Transportation Co., Detroit, Mich.: Steamer—A. E. Stewart, Capt. Fred Stewart, Engineer Robert Lacey

Green, A., Green Bay, Wis.: Steamer—George Burnham, Capt. Louis Strahon, Engineer Charles Elliott.

Sickelsteel, M. E., Detroit, Mqich.: Schooner—L. H. Hammond, Capt. G. G. Hackett.

Hartman, Adam, Tonawanda, N. Y.: Schooner—Buffalo, Capt. Thomas McDermott.

Walczak, Stephen, Wilwaukee, Wis.: Schooner—L. B. Coates, Capt. H. Brandt.

Jean, August, Buffalo, N. Y.: Schooner—S. J. Tilden, Capt. John Welch.

STEEL LIGHTER TO BE BUILT

The Empire Ship Building Co. of Buffalo has just booked a contract to build a steel steam lighter for the Merchants Lighterage Co. of Chicago, for service on the Chicago river. The boat will be 110 ft. long over all by 30 ft. beam by 12 ft. molded depth and will carry 150 tons of freight on the main deck. She is designed with the view to having her deck as near to the level of the docks as possible in both the light and loaded condition and also to go under all the Chicago river bridges. The keel is dipped considerably at the stern in order to have the propeller always immersed even in light trim. The bow framing is closely spaced and heavily plated for encountering ice, and panting stringers fitted in fore peak. She will have a single engine 20 in. cylinder by 20 in. stroke and a Scottish return flue tubular boiler 9½ ft. in diameter by 11 ft. long, built for a working pressure of 150 lbs. per sq. in. A Sheriffs' steam steerer and American Ship Windlass Co.'s double purchase capstan will be installed forward and the boat in all other respects will be much more complete than is usual in vessels of her class. Delivery is promised for June 30, 1905, and her performance will be watched with interest as she is a radical departure from the type of wooden boats which have been doing the work on the Chicago river for many years. The plans and specifications were prepared by W. J. Wood, naval architect of Chicago, who will also superintend the construction of the vessel.

Mr. J. C. Lake, the father of Simon Lake, the inventor of the Lake submarine boat, has filed a sensational appeal with President Roosevelt asking that the contracts recently awarded to the Holland Submarine Torpedo Boat Co. be cancelled on the ground that they were illegally made. His contention is that the Lake Torpedo Boat Co. was not given a fair trial.

ITEMS OF GENERAL INTEREST

The new Portsmouth dry dock has been accepted by the government. The dock is now ready for use.

For the purpose of improving the transatlantic mail service the mails on board the White Star Line steamers will hereafter be sorted on board ship in order to facilitate delivery. The system will be the same as that in use on the American railroad cars.

The City of Philadelphia is now advertising for bids for the construction of an ice crusher from designs by Melville & McAlpine. The plans call for a vessel 232 ft. 4 in. over all, 222 ft. 4 in. on the water line, 45 ft. beam, molded, and 13 ft. draught. She will be fitted with screws fore and aft.

The annual directories put out by the various lodges of the Marine Engineers' Benefit association are usually full of information and are very compact works of reference. They are extremely valuable aids to those desirous of reaching various members of the lodges. The Marine Review is in receipt of directories from the following lodges: No. 87 of Detroit; No. 2 of Cleveland; No. 9 of Milwaukee; No. 92 of Saginaw; No. 44 of Manistee; No. 37 of Toledo; No. 43 of Port Huron; No. 35 of San Francisco; No. 7 of Portland, Me. The Portland directory also contains the roster of No. 82 of Bath.

It was arranged to launch the four Staten Island ferry boats from the yard of the Maryland Steel Co., Sparrow's Point, Md. on Saturday last. The Manhattan was launched without a hitch but the Bronx refused to move and blocked the launching of the Brooklyn and Queens. A sudden hardening of the tallow on the ways due to the falling of the temperature, was the cause. The new ferry boats are powerful and roomy and their total cost is $1,709,000. They are 250 ft. long, 66 ft. beam and draw 12 ft. of water. They are intended to make the trip from St. George to the battery in twenty minutes and are designed for a speed of 18 miles an hour.

Retail dealers in lumber in the northwest are preparing for a fight against commercial bodies and farmer's organizations, who are investigating the selling price of lumber in the smaller places. The consumers are paying high prices and being told that high railroad rates are responsible for the excessive cost. Recent research on the part of persons interested in regulating railroad rates opened a new field of work, as it developed that the dealer was exacting a personal profit of from $4 to $8 a thousand feet. In North Dakota No. 3 common boards are selling at from $15 to $16.75 per thousand feet, No. 2 cedar siding $18 to $19, No. 2 fir flooring $25 to $27 and the other grades in proportion. The fight promises to become interesting, and will undoubtedly have some effect upon the claim of rate regulators that freight rates are excessive, especially if it is shown that the retailer's profit is exorbitant.

The agitation relative to freight rates has had a beneficial effect upon the people who use eastern coal in St. Paul. Last fall it was stated that the high prices on soft coal were due to excessive freight rates and the railroads were drawn into the controversy. The facts were promptly brought out and it developed that retail coal dealers were exacting profits ranging from $2.50 to $4.50 per ton. The railroad companies took up the matter in a vigorous way and during the past winter, coal has been sold to the small consumers in the country and village districts at an average profit of $1.25 per ton. As a result of this investigation commercial bodies and farmers' societies are pursuing the subject further, with a view to ascertaining whether so-called excessive freight rates are mythical and are being used as a reason for increased profits to the seller.

The work of constructing a new double track line between Hasleton and Cuyahoga Falls, O., on the Pittsburg division of the Baltimore & Ohio Railroad is expected to be ready for service by May 1. The new line is part of the plan of straight-

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ening the alignment and reducing the grade of the Baltimore & Ohio railway. It shortens the distance from Hasleton to Cuyahoga Falls by six miles. In constructing the line it was necessary to relocate and reconstruct a part of the old Youngstown Railroad commonly known as the Trumbull & Mahoning Railroad, formerly a narrow gauged road but not operated since the fall of 1878. Coincident with the improvement grade crossings are being abolished. The work is under the direction of Mr. D. D. Carothers, chief engineer of the Baltimore & Ohio Railroad and Mr. S. M. Kinsman, engineer of construction. In addition to track improvement the Baltimore & Ohio is building a new passenger station at Youngstown. It is to be finished throughout with quartered oak with marble mosaic floors. The exterior walls will be constructed of brown sand stone and gray pressed brick and the roof will be covered with red tile.

In an opinion by Judge Day the supreme court of the United States has reversed the decision of the circuit court of appeals for the ninth district in the case of Hackfield & Co. against the United States. The case involved the construction of the law holding ship owners responsible for the negligence to return immigrants when required to do so. In this case the immigrants were Japanese who escaped from a locked room on shipboard. The government took the position that the state requires the return of immigrants under all circumstances and the district court of appeals took that view. The supreme court, however, took the view saying that ship owners are required only to exercise due diligence in such cases and failed to hold the ship owners responsible for the escape of the immigrants.

Mr. J. L. Vance and Mr. J. F. Ellison, president and secretary respectively of the Ohio Valley Improvement association spent several hours in Cleveland last week in conference with Hon. T. E. Burton, chairman of the committee on rivers and harbors of the house of representatives, relative to the proposed trip of the committee along the Ohio river from Pittsburg to Cairo. The committee and others interested will meet in Pittsburg on May 9 and the trip will begin on May 10. It will occupy eight days during which time all the important points between Pittsburg and Cairo will be visited. The Ohio Valley Improvement association is urging the construction of a 9-ft. waterway along the Ohio river from Pittsburg to Cairo.

The Southern Ship Building Co. of Jacksonville, Fla., has just launched its third schooner-rigged barge. The barge was christened Southeast by Miss Helen Coachman of Jacksonville. She is a duplicate of the two preceding schooners built for the Cook-Cummer Steamship Co. The barge's dimensions are: length between perpendiculars, 175 ft., beam 35 ft., depth 19 ft. The barge will carry about 650,000 ft. of lumber on about 17 ft. draught. The Southern Ship Building Co. is now laying the keel for a four-masted schooner for Jacksonville parties to be used in the lumber trade. She will be 166 ft. keel, 37 ft. beam and 13 ft. deep.

The naval engineers have begun work on the machinery designed for 1906 battleships. There will probably be no material change in the engineering equipment of these vessels which are destined to resemble closely the New Hampshire, and have the same speed provided for that vessel. The naval constructors are also at work on the plans for the hull and it is believed that the principal characteristics of the new ships will closely resemble those of the type now under construction. The main difference will be the battery which will consist of larger caliber guns than has been the case in the armament of vessels hitherto designed and built.

Suit has been instituted in the district supreme court at Washington by George B. Spearin of Bayonne, N. J., to compel Admiral Mordecai T. Endicott, chief of the bureau of yards and docks, navy department, to deliver to him a certified check for $25,000 for cancellation. Mr. Spearin was the lowest bidder for the construction of a dry dock at the New York navy yard but subsequently discovered the addition of certain details of one item amounting to $100,000. Admiral Endicott declined to amend the bid to this extent and Mr. Spearin asked that the check be returned to him. This the admiral has declined to do.

The Cramps at Philadelphia launched last week the steamer Chippewa for the East Caicos Co., Turk's Island, West Indies. She was named by Mrs. Henry W. Hand, the wife of the general manager of Cramp's. The Chippewa and her sister ship, the Onondago, which will be launched soon, are of the same type as the Mohican of the Clyde Line. Her construction has been unusually rapid as the keel plates were laid only in November last.

The new side-wheel steamer Providence, built for the Old Colony Steamboat Co. by the Fore River Ship Building Co., Quincy, Mass., has been accepted by the company as fulfilling every requirement. In her sea speed trial she maintained a speed of 23 miles an hour for four consecutive hours.

The admiralty court of Halifax has fixed a bail on the steamer Albano on account of the collision with the Parisian for $82,000 for the damage to the ship and a similar amount for injury to freight, a total of $164,000. The Parisian will be towed into the dry dock for repairs.

OBITUARY

Few will recall the Rt. Hon. Sir Charles Bowyer Adderley who died in Hamshall near Birmingham, England, last month. He had a long and honorable career in and out of parliament, and while his activity had not been along shipping lines he sensibly effected British shipping through the enactment of what is known now as the Plimsoll law. Plimsoll had introduced a merchant shipping bill in parliament in 1874 and in the course of his speech made several startling charges against the Board of Trade. Sir Charles Adderley in a somewhat acrimonious tone replied to Mr. Plimsoll's speech and denounced the bill in a most scathing manner. It was rejected by a narrow vote. In the next session the government itself was compelled by the force of public opinion to introduce a merchant shipping bill of its own. This bill was prepared by Sir Charles Adderley. Fierce fights were waged over it and it was so obstinately attacked that it could not be carried through. When the government near the close of the session announced that the bill would have to be sacrificed Mr. Plimsoll created great excitement by rushing to the middle of the floor and shouting "I am determined to unmask the villians who sent these men to their graves," referring to the terrible losses of sea casualties to so-called "coffin-ships." After a week's suspension Mr. Plimsoll apologized to the house. A new merchant bill was introduced by Sir Charles Adderley in the following session and passed after the opposition lead by Mr. Plimsoll had exhibited all its powers of criticism. It was found, however, to be a fairly workable measure.

Capt. Chas. J. Magill, widely known as a vessel owner, died in Chicago last week at the home of his daughter, Mrs. Edmund C. Ward, 67 Jackson Boulevard. He was eighty-six years old. He came to the great lakes region in the spring of 1843 and owned the first line of propellers that ever went to Chicago, the Watson A. Fox Line. He also owned and controlled the Empire Line and a large number of sailing vessels.

The force at the yard of the Superior Ship Building Co has been increased and the work of enlargement on ships Victory and Constitution is going forward very rapidly. It is possible that it may not be completed by the opening of navigation. The 569-footer of the Pittsburg Steamship Co. is assuming shape very fast, though there has been much delay in getting material.

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BRITISH ADMIRALTY CHARTS

Following is the list of new charts issued by the British admiralty and handled by J. D. Potter, 145 Minories, London:

NEW CHARTS.

No. 2287. Tidal streams round the British isles.
No. 2498. Scotland, west coast:—Southern part of the sound of Raasay and Inner sound.
No. 3441. Scotland, west coast:—Gairloch.
No. 3422. Scotland. Hebrides:—East loch, Roag
No. 3443. Ireland, southwest coast:—Crookhaven, Ballydivlin and Troomore bays.
No. 3467. Iceland, plans on the north coast:—Kalshamarsnes. Blondaos. Selvig. Hagenesvig. Sandvig Husevig. Snerstastadir. Thorshavn.
No. 3462. British Columbia:—Southgate group and anchorage.
No. 3464. Alaska. Harbors and anchorages in.
No. 3477. Africa, west coast:—Port Forcados.
No. 628. Africa, west coast. Bight of Biafra:—Opobo river.
No. 839. East Indies. Andaman islands:—Port Meadows and Kotara anchorage.
No. 3471. Sumatra:—Banka strait.
No. 3463. Philippine islands, Mindanao, south coast:—Dumankilas bay.
No. 3449. China, east coast:—Amoy, outer harbor.
No. 1260. China, north coast:—Ching tsu shan to Chifu bluff, including Chifu or Yentai harbor. (Plan:—Chifu or Yentai landing).
No. 3468. China, northeast coast. Plans on the coast of Shantung:—Malan and Lungyen coves. Yangyuchih bay. Litau bay. Ayleu bay.
No. 3457. China, north coast:—Litau bay to Chutau, including Wei hai wei harbor.
No. 3019. Japan. Kiusiu, north west coast:—Imari wan and approaches. (Plan:—Hibi Suido).
No. 2441. Japan:—Tsugaru strait.
No. 3455. Japan. Nipon, south coast:—Aikuchi bana to Yeboshi bana, including Nagashima wan and Kanzaki wan. Nishiki wan.
No. 3460. Japan. Nipon, south coast:—Ino hana to Aikuchi bana, including Kada wan and Owashi wan. Kuki ura.
No. 3458. New Guinea, plans of anchorages on northeast coast:—Buna roads. Oro bay. Port Harvey. Anasari harbor. Pusi Pusi harbor. Wamnea anchorage. Kitava island anchorage
No. 3436. New Zealand, east coast:—Plate island to Cape Runaway.
No. 1103. North Pacific ocean:—Palao or Pelew islands. Korror harbor. Helen reef. Mapia island. Los Martires.
No. 3461. Pacific. Tubuai islands:—Vavitao or Ravaivai.
No. 87. Spain and Portugal, west coasts. Plan added:—Sines bay.
No. 1128. Mediterranean sea. Sardinia. Ports in. Plan added:—Arbatax road.
No. 2634 Mediterranean sea Syria. Ras En-Nakura to El Arish. Plan added:—Yafa anchorage.
No. 369. Cape Verde islands. Plans added:—San Filippe and Encarnaçao anchorages. Port St. Jago. New plans:—Porto Praya. English road (Mayo I.).
No. 3004. Iceland. Places on the south and east coasts. Plan added:—Vestmannaeyjar.
No. 652. Africa east coast. Plan added:—Mozambique anchorage.
No. 1809. Africa, east coast. Mozambique to Ras Pekawi. Plans added:—Port Duarte Pedroso. Belmore harbor. Port Nakala.
No. 764. Southwest Pacific. New Hanover, etc. Plan added:—Peter haven.
No. 55. Southwest Pacific New Ireland, etc. New plan:—Nusa harbor.
No. 1167. England, west coast:—Burry inlet.
No. 1543. England, east coast:—Yarmouth and Lowestoft roads, etc.
No. 1625. England, east coast:—Seaham harbor.
No. 2206. Baltic:—Gulf of Bothnia. Sheet I.
No. 2646. France, west coast:—Bourgneuf to Ile de Croix.
No. 2989. France, west coast:—Entrance to the Loire river.
No. 2664. France, west coast:—Pointe d'Arcachon to Pointe de la Coubre.
No. 92. Spain, west coast:—Cape St. Vincent to Gibraltar.
No. 1567. Africa, north coast:—Approaches to Bona.
No. 308. North America:—Gulf and river of St. Lawrence. Plans in.
No. 2818. United States, east coast:—Hampton roads.
No. 900. South America:—Pernambuco roads.
No. 551. South America, east coast:—Port San Antonio. Port St. Elena.
No. 461. Africa, west coast:—Wari and Benin rivers and creeks.
No. 622. Africa, west coast:—Bonny and New Calabar rivers.
No. 1810. Africa, east coast:—River Zambesi to Mozambique harbor.
No. 605. Africa, east coast:—Zanzibar harbor and its approaches.
No. 1235. Persian gulf:—Mouth of the Euphrates.
No. 1419. Bay of Bengal. Andaman islands:—Long island to Port Blair.
No. 1348. Borneo:—Natuna islands.
No. 1180. China, east coast:—Approaches to Hongkong.
No. 2618. China sea. Formosa, north coast:—Ke lung harbor.
No. 1798. China, north coast:—Kwang tung peninsula, etc.
No. 1259. Korea:—Fusan harbor.
No. 2875. Japan Naikai, Seto uchi.
No. 2924. Australia, east coast:—Cape Grafton to Hope islands.
No. 2923. Australia, east coast:—Hope islands to Turtle group.
No. 939. New Guinea:—Cape Nelson to Hercules bay.

DEMOCRACY AND AMERICAN MERCHANT MARINE

Mr. John Sharp Williams thus defines his conclusion upon the upbuilding of the American merchant marine in a speech delivered in the house of representatives on Jan. 21, 1904. It is lifted from the congressional record:

"Why, the old Democratic party has blazed away in the past and put upon the statute books the only legislation that ever successfully built up an American merchant marine, and we propose to build it up as Jefferson and Madison did, not by burdening the people with taxation, but by relieving the people from taxation. While the doctrine is Democratic, it is not un-Republican. You will remember that in 1896, when you nominated Mr. McKinley, in your platform you then advocated building up an American merchant marine by 'discriminating import duties. We Democrats do not, like Senators Hanna and Frye, recommend an experiment. Our plan has been tried, success never denied, and we are ready to try it again. I am not willing that any special industry shall be built up by taxing all the people, but I am willing that it may be done by untaxing some or all of the people."

MINNESOTA'S PROFITLESS TRIP

From the latest and most authentic reports on the northern coast it seems that the mammoth steamer Minnesota owned by James J. Hill of the Great Northern Railway Co., will lose $60,000 as the result of her first voyage to the Orient. Although she carried many passengers and a cargo of 22,000 tons of freight, the fact that the big steamer could not discharge her cargo except by means of lighters and at a long distance from the usual places in the Oriental ports, has proved one discouraging source of expense. It is said also that the cost of operating amounts to $2,800 per day or nearly twice as much as other vessels carrying nearly as much freight. The great draught of the Minnesota and her slow speed appear to have placed a ban upon her as a competitor for business on the Pacific.

The Great Lakes Towing Co. concluded a contract last week with the Tug Firemen and Linesmen Protective association upon the basis of last season's scale of wages. The men at Cleveland, Buffalo, Chicago and other large ports will get $60 a month and those at the smaller ports $55 a month. The union desired a uniform scale of $60 for all the ports. The company felt that this was unreasonable, however, as the men at the smaller ports do not do the same amount of work as the men at the larger ports.

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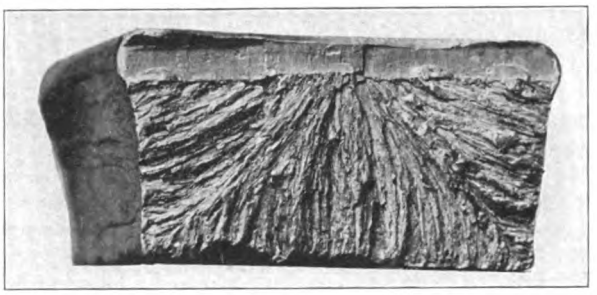
ANTI-FRICTION METAL

An interesting feature in the line of anti-friction metals, and something which is entirely new, is shown in the half-tone reproduction published herewith. The particular point of interest lies in the peculiarity of crystallization and forms the chief basis of claims of superiority which are made by its producers. The photograph represents a piece of metal which has been nicked on one side and after being placed in a vise, has been broken off by a sharp blow from a heavy hammer. This operation reveals a fibrous, stringy mass; the crystals, it will be seen, extend perpendicular to the chilling surfaces. The alloy is of tin and aluminum base and a remarkable characteristic is that these fibers always radiate from the chilling surfaces, regardless of the number of times reheated, thereby presenting the ends and not the sides of the fiber to the sliding friction surface.

It is well known that in the case of wood and of wrought iron the surface exposing the ends of the fiber will stand a greater amount of crushing weight and wear, than the sides of the material. It was for this same principle in an alloy that the metallurgist who produced this worked. His efforts extended over a period of twenty years and the result is claimed to be all that could be wished. To prove the soundness of the theory of resistance to wear the composition was given many severe tests which were, in all instances gratifying.



ILLUSTRATING FRACTURE OF A NEW ANTI-FRICTION ALLOY.

Its great toughness and malleability combined, it is claimed, permits it to withstand the most severe shocks without becoming brittle or what is ordinarily called "crystallized."

A close examination of the fractured metal shows it to be of so fine and smooth a texture, with no granular matter intervening, that it may be said to be a truly chemical compound. Users of anti-friction metals always experienced difficulty in remelting and using them over, owing to the grosser metals—those which melt at the lowest point—volatilizing and escaping which leaves the composition harder with each pouring. The producers of this metal say they have entirely overcome this and that by a perfect combination of metals they have secured an alloy which, it might be said, has produced—not a new composition—but an entirely new metal in itself that will admit of remelting an indefinite number of times without becoming hard or harsh or losing any of its original properties. The characteristics of this metal would make it particularly desirable for use in linings of driving box and engine truck brasses, eccentric straps, cross head gibs, steam and gas engine bearings, ships' bearings, wood working, and all kinds of high speed machinery.

The Buda Foundry & Manufacturing Co. of Chicago will place this metal on the market, together with some new bronzes and a copper-steel composition, the latter being, they say, a rediscovery of the lost art of copper hardening. This new departure on the part of the Buda Foundry & Manufacturing company, whose former output has been largely confined to track supplies, will in the future be made an important branch of their increasing business, though it will not in any way interfere with their railroad specialties. "We are attracted to these metals," said Mr. H. K. Gilbert, secretary of the Buda company, "by the exceptional merits which they possess. Thorough tests have convinced us that we have in them, something which will be an agreeable surprise to users of anti-friction alloys, and that they will create a great demand for themselves. We are sending out samples free to interested persons, and an examination will show them to be of unusual interest and value."

TRADE NOTES

The Seidler-Miner Electric Co., 207-211 Jefferson ave., Detroit, have recently put out a catalogue devoted to electric lighting of ships. The company has installations on steam vessels on the lakes, oceans, coasts and Mississippi river. During recent years there has been a marked advance in marine electrical equipment. No steam vessel today is fully equipped unless electrically illuminated. The oil lamp with its uncleanliness and its menace to concentrated property has been justly relegated to the past. The economy, convenience and absolute safety of the electric system are its important advantages. The catalogue illustrates a long line of improved fixtures and fittings, and the company, being the manufacturers or the sales agents of the special appliances listed in the catalogue, are in position to quote the lowest prices and make prompt shipments. The catalogue is very completely illustrated throughout with wash drawings and price lists are given on nearly every page. It is therefore extremely convenient for consultation and makes an invaluable reference book to anyone interested in the subject.

The Double-Friction Coil Clutch Co., 42 River street, Chicago, have just issued a little catalogue devoted to the double friction coil clutch. The company says that the double friction coil clutch will absolutely do the work on a low speed shaft when others have failed and can be adjusted to slip at any desired horse power. The company says that its clutches are scientifically constructed and are compact and thoroughly reliable. They have a larger capacity, are more durable and cost less for repairs and maintenance than any other clutch on the market and afford many opportunities for economizing space. The little booklet is well illustrated and is argumentative throughout and is really well worth writing for.

The address of the Armstrong Cork Co. is now 1319-1320 Farmers' Bank building, Pittsburg, Pa.

The Crane company maintains fifteen separate manufacturing plants and warehouses in Chicago and is represented by branches in Omaha, established 1886; Kansas City, 1887; Los Angeles, 1887; Philadelphia, 1890; San Francisco, 1891; Minneapolis, 1892; St. Paul, 1893; New York, 1894; Portland, Ore., 1894; Duluth, 1894; Sioux City, 1897; Oakland, Cal., 1898; Cincinnati, 1899; St. Louis, 1899; Salt Lake City, 1902; Seattle, 1902; Watertown, S. D., 1903; Chanute, Kan., 1903; Independence, Kan., 1904; Spokane, 1904; Fargo, N. D., 1904; Baltimore, 1904; Memphis, 1904; Dallas, 1904, and Birmingham, 1905. It stands now, in its chosen lines, the largest manufacturing company in the world.

The Bruening Cork Co., Oakdale, Pa., will place its new plant in operation about May 1, and will commence the manufacture of life preservers, buoys and all life saving appliances about the middle of the month. The new building is five stories high and is 200 by 65 ft. It is equipped with the most modern cork producing machinery and the facilities for producing the appliances for the marine trade are the best available.

The American Steel & Wire Co. has issued a booklet upon the subject of "Sulphate of Iron in Agriculture." The book is a compilation of data covering the uses of sulphate of iron on the farm. The company does not claim that sulphate of iron is a "cure all" but it possesses special merit for many purposes and when properly used is of great value on the farm, especially in view of its cheapness.

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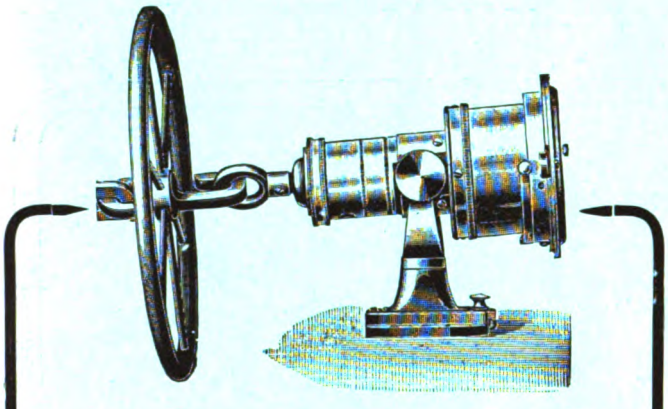

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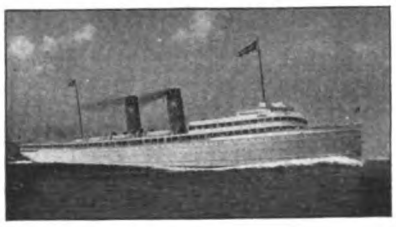

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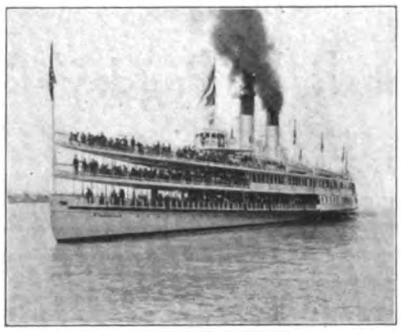

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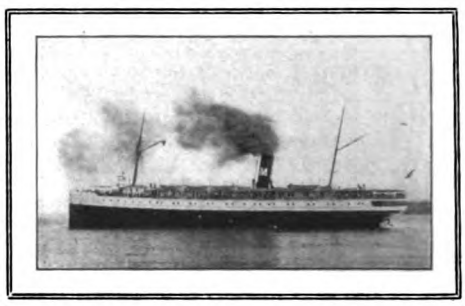

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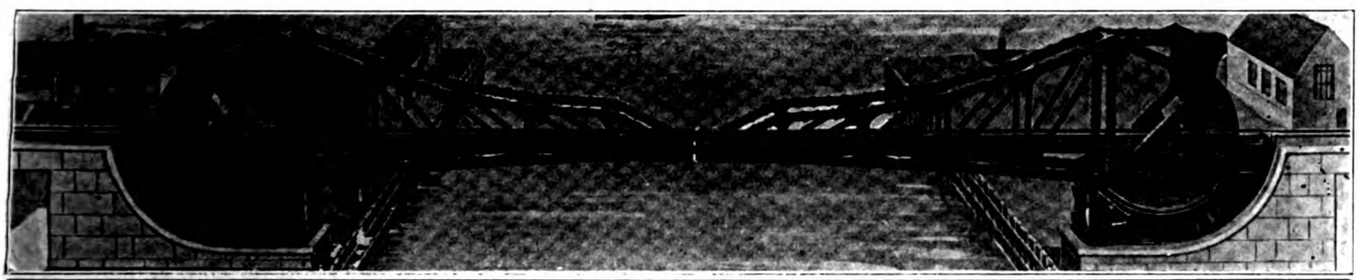

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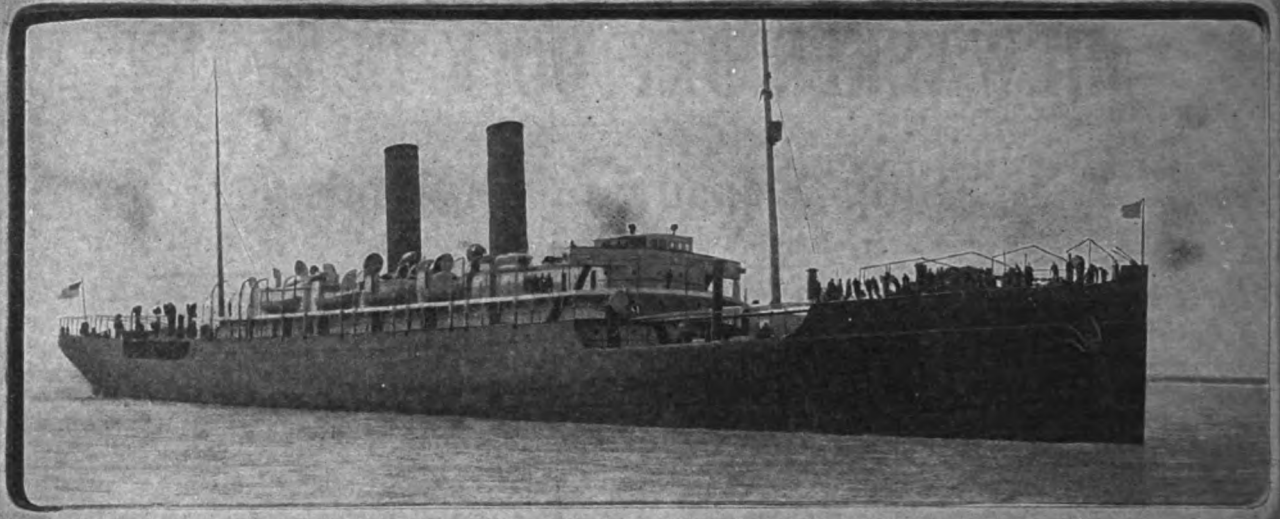

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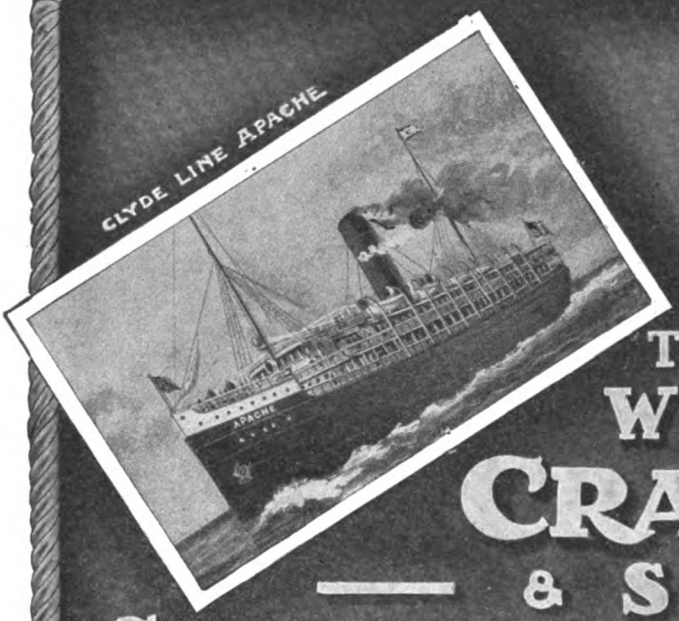

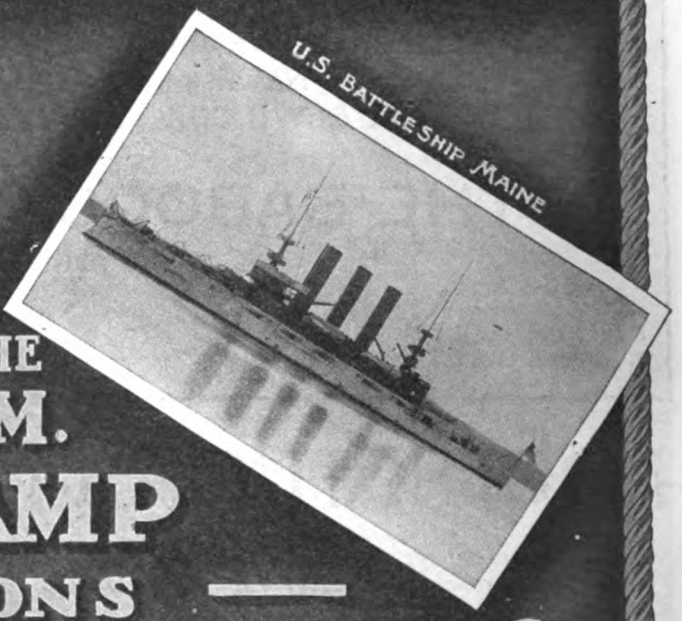

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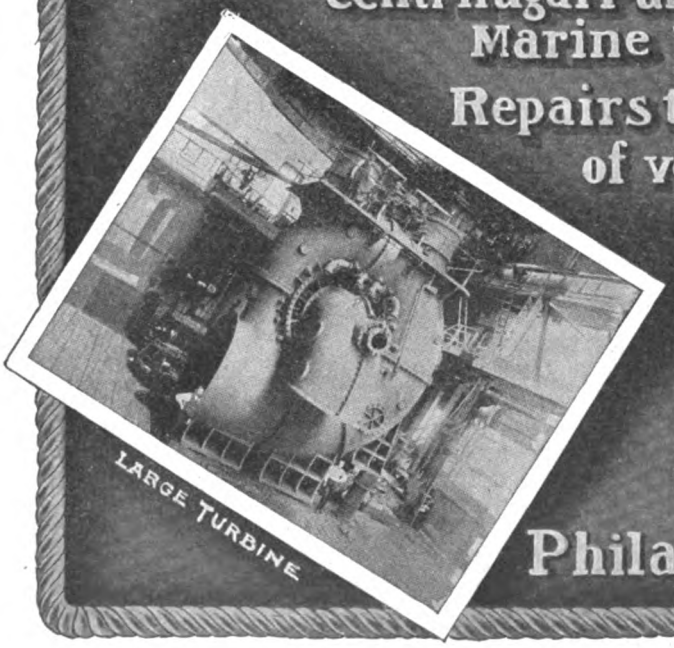

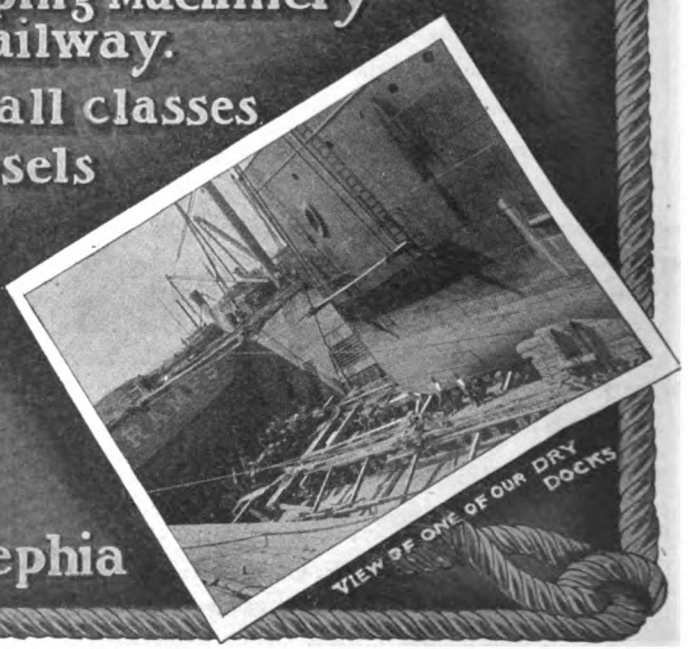

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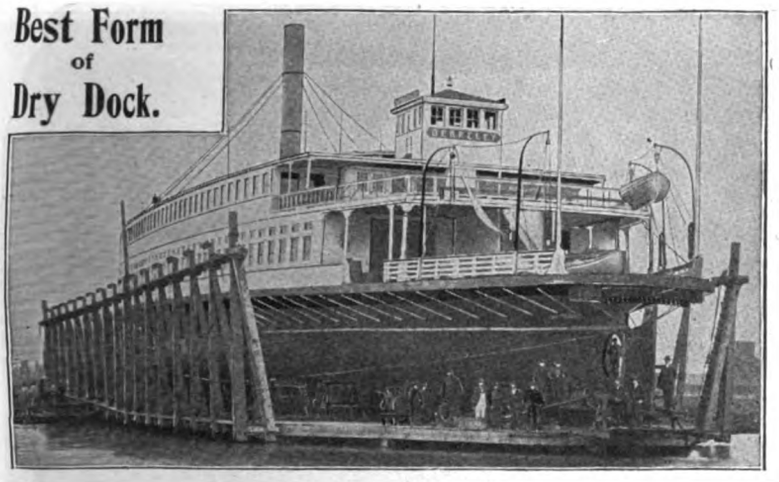

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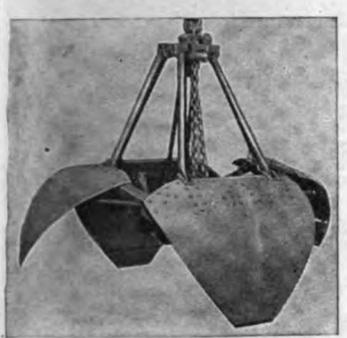

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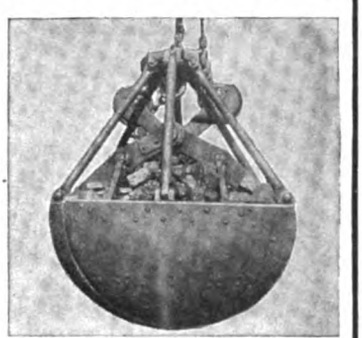

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PITTSBURG AND YOUGHIOGHENY COAL

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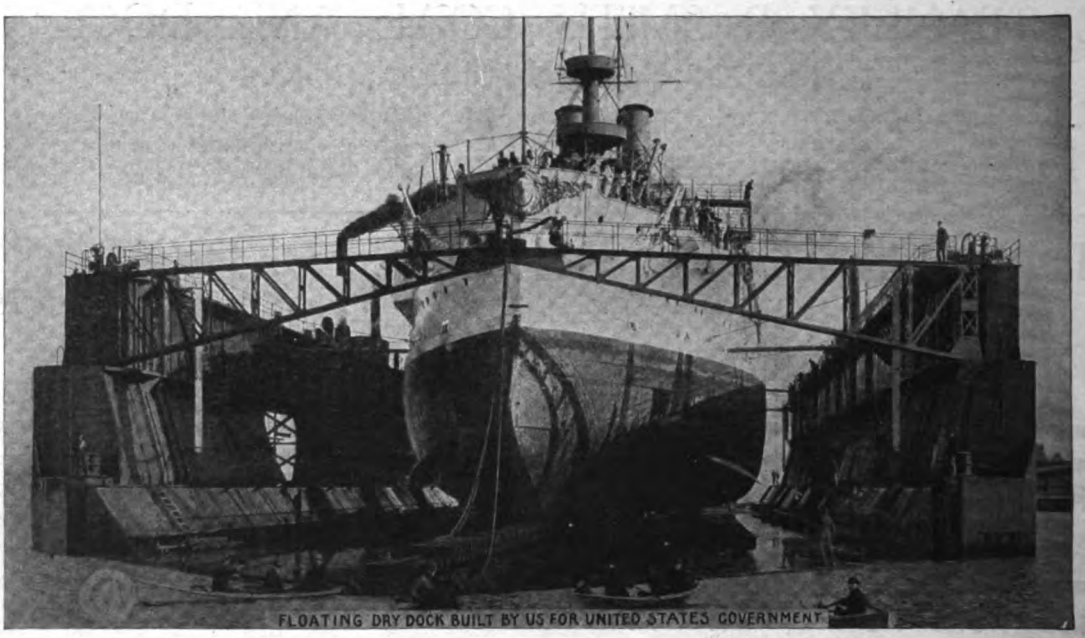
MARYLAND STEEL COMPANY

BUILDERS OF STEEL STEAMSHIPS, TOW BOATS, SAILING VESSELS, BARGES AND STEAM CRAFT OF EVERY DESCRIPTION

STEEL FLOATING DRY DOCKS CAPABLE OF DOCKING THE LARGEST VESSELS



FLOATING DRY DOCK BUILT BY US FOR UNITED STATES GOVERNMENT

SPARROW'S POINT, MARYLAND.

G. KLEIN

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Gold Medal

Awarded Dearborn Methods of Treating Boiler Waters and Dearborn Vegetable Feed-Water Treatment at the World's Fair, St. Louis.

DEARBORN DRUG & CHEMICAL WORKS

G. R. CARR, Mgr.
MARINE DEP'T.

16 Branch Offices in U. S.

27-34 Rialto Bldg., CHICAGO.

THE ROBERTS
SAFETY WATER-TUBE
BOILER CO.

Manufacturers of High Grade

Marine Water Tube Boilers

Generators of the Highest Quality of Steam

NEARLY 1500 IN USE

Send for circulars and stock sheet

MAIN OFFICE
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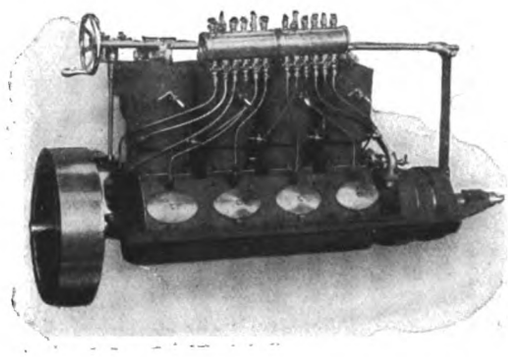
Works: Red Bank, N. J.
Phone, 49 Red Bank

Cable Address
"Bruniva"

TRUSCOTT

THE DEPENDABLE MARINE MOTOR



Made to withstand the most severe and continuous service. A practical design characterized by the accessibility, compactness and simple ignition, gas producing and oiling features. Perfect control.

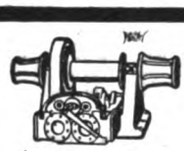
Four cycle type two and four cylinders, from 8 to 65 H. P. Smaller sizes of the two cycle type.

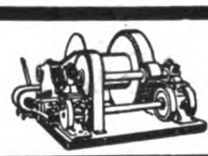
Catalogue and copy of The Launch for the asking.

Department 46.

Truscott Boat Mfg. Co.

ST. JOSEPH, MICHIGAN.





GASOLENE MARINE ENGINES
Suitable for all Boats from 3½ to 200 H.P.
Over 100 in successful use.
Also the well known and always reliable Woolters Gas or Gasolene Stationary Engines.

HOISTING ENGINES
Of all kinds and sizes, and for all purposes, especially for ship use.
Docking and Hauling Engines and Wire Rope Windlasses.

AUTOMATIC TOWING MACHINES
Somewhat the cheapest, and altogether the best. Positively guaranteed.
Automatic Fog Whistle Machines
Steam Steering Engines.

FOR THESE AND OTHER WELL KNOWN SPECIALTIES ADDRESS ALL INQUIRIES TO.

THE CHASE MACHINE CO. Engineers and Machinists, CLEVELAND, OHIO.

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Builders of

SHIPS — ENGINES — BOILERS
HEAVY MACHINERY

Launch of "Mongolia," Pacific Mail S. S. Co., July 25, 1903.
615 feet long, 65 feet beam, 51 feet deep.

Best Facilities for Repair Work

Pneumatic and Electric Tools;
ample wharfage accomodation.

100 ton crane.

Repairs done under shelter.

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Engineers' Number

The Marine Review of May 4 will be devoted to topics that interest the men below deck, or aft as they would say on the great lakes.

The modern vessel is becoming more and more an engineer's problem. Hundreds of devices are finding their way aboard ship. Mechanical ingenuity is supplanting hand labor in various ways. On some ships the auxiliary equipment is practically all electrical. Changed conditions have brought their little problems with them.

Marine engineers are invited to relate their experiences, to tell of things that happen in the day's work. The Marine Review will pay them for the articles.

Look for the Marine Review of May 4.

The "New Kind" of Boiler

tried and tested for ten years and under all conditions, and acknowledged by all who have used them or seen them in operation THE PERFECTION OF THE WATER TUBE SYSTEM.

DEARING WATER TUBE BOILERS

are built more scientifically and consequently are more efficient than the old kind. They show some brand new ideas—some progressive thought in their construction.

They have surmounted every irritating obstacle and overcome all the minor troubles so conspicuous in other makes.

As to the salient points—the crucial and imperative features—why, just drop us a postal and we will send you facts and figures.

Dearing Water Tube Boiler Company

DETROIT
MICHIGAN

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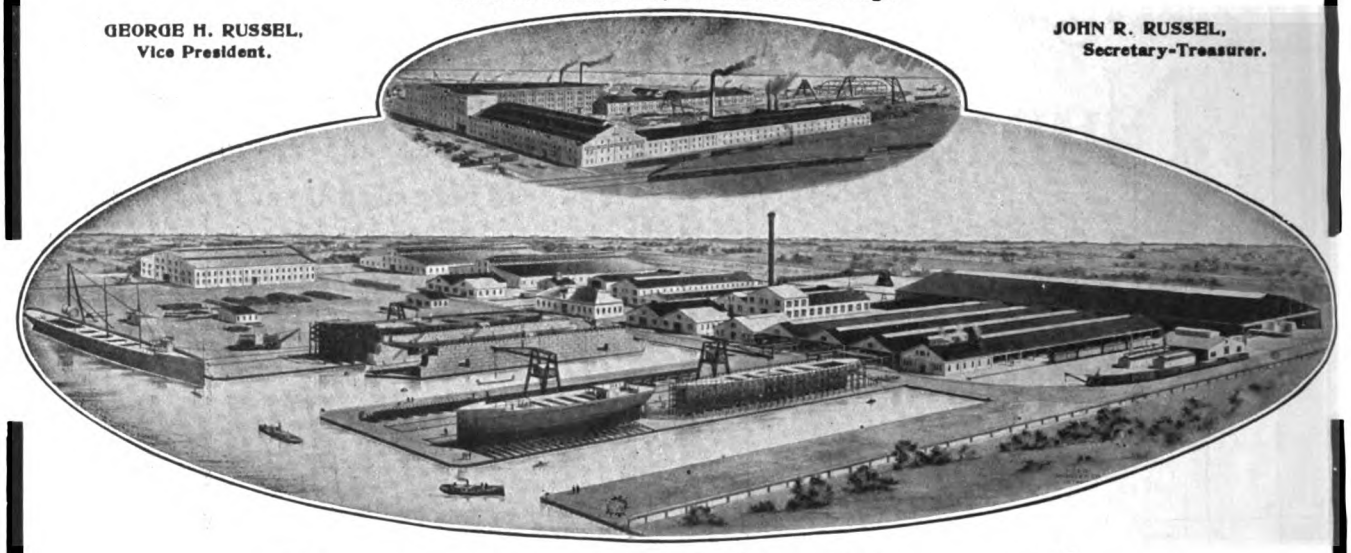
GREAT LAKES ENGINEERING WORKS

DETROIT, MICH.

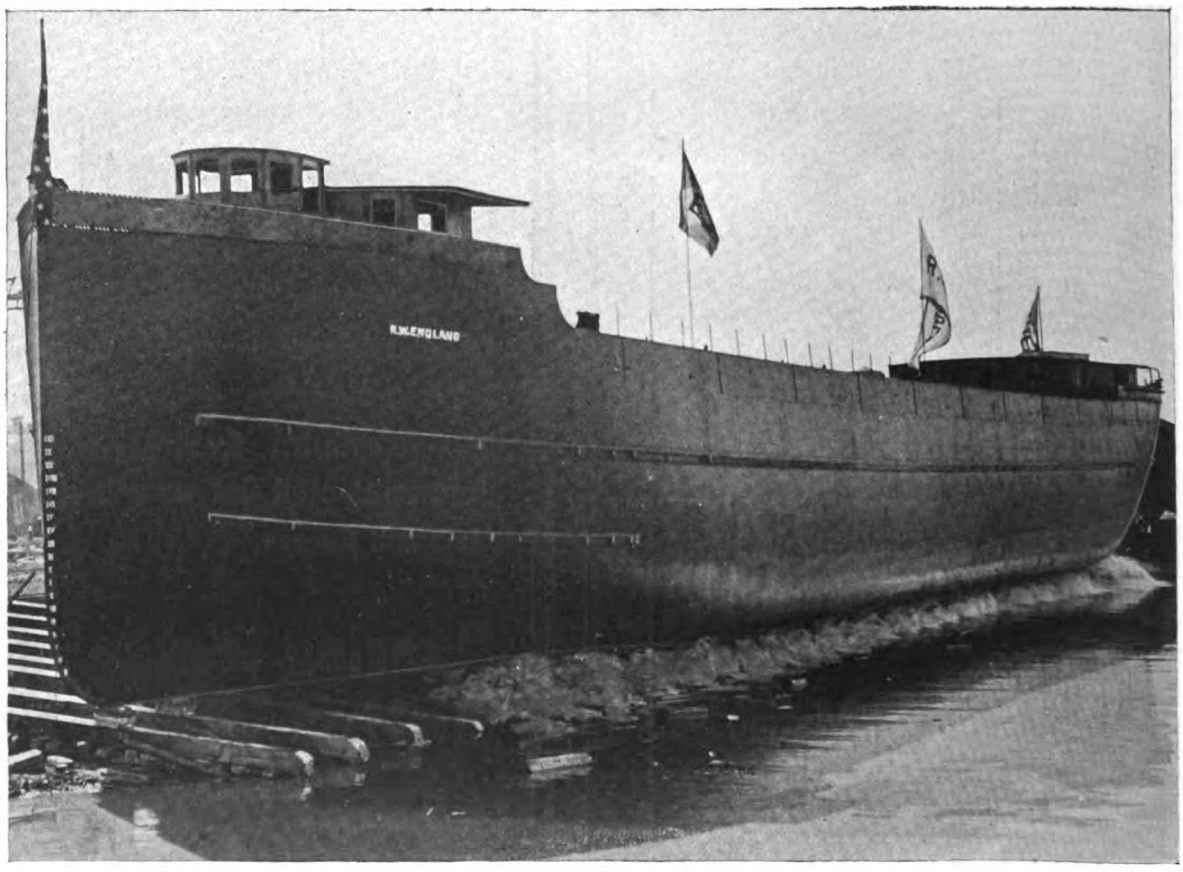
ANTONIO C. PESSANO, President and Gen. Mgr.

GEORGE H. RUSSEL, Vice President.

JOHN R. RUSSEL, Secretary-Treasurer.



Designers and Builders of
Steel Freight and Passenger Ships.
Marine Engines. = Hydraulic Dredges.



Marine Repairs a Specialty

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BELLEVILLE WATER-TUBE BOILERS

NOW IN USE (MARCH, 1905)

On Board Sea-going Vessels, NOT INCLUDING New Installations Building or Erecting.

French Navy	360,560 H. P.
English Royal Navy	966,300 "
Russian Imperial Navy	253,800 "
Japanese Imperial Navy	122,700 "
Austrian Imperial Navy	56,700 "
Italian Royal Navy	32,500 "
Chilian Navy	26,500 "
Argentine Navy	13,000 "
The "Messageries Maritimes" Company	87,600 "
Chemins de fer de l'Ouest: (The French Western Railway Co.) Steamships plying between Dieppe and Newhaven	18,500 "
Compagnie Generale Transatlantique	1,500 "
Total Horse Power of Boilers in Use	1,939,660

Societé Anonyme des Etablissements Delaunay Belleville

CAPITAL: 6,000,000 FRANCS

Works and Dock Yards of the Ermitage at Saint-Denis (Seine), France.

Telegraphic Address: Belleville, Saint-Denis-Sur-Seine

Geo. L. McCurdy

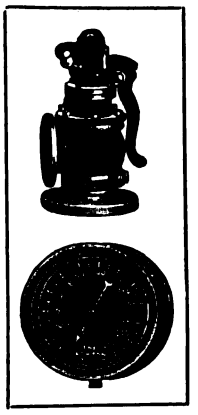
169 Jackson Boulevard

CHICAGO ILLINOIS

INSURANCE

HULLS and CARGOES

DIRECT REPRESENTATIVE OF LEADING AMERICAN AND FOREIGN UNDERWRITERS



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Cam Lever Pop Safety Valves and Non-Corrosive Steam Gauges.

give highest efficiency and durability. Specify them and get the best.

The Ashton Valve Co.

Boston New York Chicago

U. S. A.

Because the mills can't promise your shipment in time, don't turn your customer away—

LOOK IN OUR STOCK LIST.

THE BOURNE-FULLER CO.

IRON, STEEL

PIG IRON

COKE

Cleveland, Ohio

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Buyers' Directory of the Marine Trade

For a more complete classification than that represented by advertisers in the Marine Review, see the BLUE BOOK OF AMERICAN SHIPPING, marine and naval directory of the United States, published by The Marine Review, Cleveland.

See accompanying index of Advertisers for full addresses of concerns in this directory.

AIR COMPRESSORS, AIR HOISTS, ETC.

Great Lakes Engineering Works.....Detroit.
Mietz, Aug. .....New York.

AIR PORTS, DEAD LIGHTS, ETC.

Marine Mfg. & Supply Co.....New York.

AIR PUMPS AND APPLIANCES.

Fore River Ship & Engine Co..Quincy, Mass.
Great Lakes Engineering Works.....Detroit.

ANCHORS.

Bowers, L. M. & Co.....Binghamton, N. Y.
Seaboard Steel Casting Co.....Chester, Pa.

ANTI-FOULING AND ANTI-CORROSIVE COMPOSITION FOR STEEL VESSELS.

Holzapfel's American Composition Co.... .....New York.

ANTI-FRICTION METALS.

Cramp, Wm. & Sons.....Philadelphia.

ARTIFICIAL DRAFT FOR BOILERS.

American Ship Building Co.....Cleveland.
Detroit Ship Building Co.....Detroit
Great Lakes Engineering Works.....Detroit
Sturtevant, B. F., Co.....Hyde Park, Mass.

ASH EJECTORS.

Great Lakes Engineering Works.....Detroit.

ATTORNEYS AND PROCTORS IN ADMIRALTY.

Gilchrist, Albert J.....Cleveland.
Goulder, Holding & Masten.....Cleveland.
Hoyt, Dustin & Kelley.....Cleveland.
Kremer, C. E.....Chicago.
MacDonald, Ray G.....Chicago.
Potter & Potter.....Buffalo.
Shaw, Warren, Cady & Oakes.....Detroit.
White, Johnson, McCaslin & Cannon Cleveland

BAROMETERS, MARINE GLASSES, ETC.

Ritchie, E. S. & Sons.....Brookline, Mass.

BELT CONVEYORS.

Link Belt Machinery Co.....Chicago.

BELTING, RUBBER.

New York Belting & Packing Co...New York.

BLOCKS, SHEAVES, ETC.

Boston & Lockport Block Co.....Boston, Mass.
Cleveland Block Co.....Cleveland.

BLOWERS.

Power Specialty Co.....Detroit.
Sturtevant, B. F. Co.....Hyde Park, Mass.

BOAT BUILDERS.

Drein, Thos. & Son.....Wilmington, Del.
Kahnweiler's Sons, David.....New York.
Lane & DeGroot....Long Island City, N. Y.
Marine Construction & D. D. Co..... .....Mariner's Harbor, S. I., N. Y.
Truscott Boat Mfg. Co.....St. Joseph, Mich.
Willard, Chas. P. & Co. Winthrop Harbor, Ill.

BOILER CLEANING DEVICE.

Power Specialty Co.....Detroit.

BOILER COMPOUNDS.

Dearborn Drug & Chemical Works....Chicago.

BOILER MANUFACTURERS.

Almy Water Tube Boiler Co..Providence, R. I.
American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Babcock & Wilcox Co.....New York.
Bertram Engine Works Co., Ltd..... .....Toronto, Can.
Chicago Ship Building Co.....Chicago.
Cramp, Wm. & Sons.....Philadelphia.
Dearing Water Tube Boiler Co.....Detroit.
Delauney, Belleville & Co...St. Denis, France.
Detroit Ship Building Co.....Detroit.
Fletcher, W. A. & Co.....Hoboken, N. J.
Fore River Shipbuilding Co.....Quincy, Mass.
Georgian Bay Engineering Works..... .....Midland, Ont.
Great Lakes Engineering Works.....Detroit.
Kingsford Foundry & Machine Works.... .....Oswego, N. Y.
Marine Iron Works.....Chicago.

BOILER MANUFACTURERS—Continued.

Maryland Steel Co.....Sparrows Point, Md.
Milwaukee Dry Dock Co.....Milwaukee.
Mosher Water Tube Boiler Co....New York.
Newport News Ship Building Co..... .....Newport News, Va.
New York Shipbuilding Co.....Camden, N. J.
Northwestern Steam Boiler & Mfg. Co.... .....Duluth, Minn.
Roberts Safety Water Tube Boiler Co.... .....New York.
Stirling, The Co.....Chicago.
Superior Ship Building Co.....Superior, Wis.
Taylor Water Tube Boiler Co.....Detroit.
Willard, Chas. P. & Co..Winthrop Harbor, Ill.

BOILER RIVETS.

Bourne-Fuller Co.....Cleveland.

BOILER STAYBOLTS, IRON OR STEEL, HOLLOW OR SOLID.

Falls Hollow Staybolt Co..Cuyahoga Falls, O.

BOILER TUBES, MARINE.

Reading Iron Co.....Reading, Pa.

BRASS AND BRONZE CASTINGS.

Cramp, Wm. & Sons.....Philadelphia.
Fore River Ship & Engine Co..Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Lunkenheimer Co.....Cincinnati.
Macbeth Iron Co.....Cleveland.

BRIDGES, BUILDERS OF.

Cowing, John P.....Cleveland.
Scherzer Rolling Lift Bridge Co.....Chicago.

BUCKETS, ORE AND COAL.

Brown Hoisting & Conveying Machine Co. ..... Cleveland.
McMyler Mfg. Co.....Cleveland.
Mayo & Bailey .....Chicago.

BULKHEAD DOORS, WATERTIGHT.

"Long Arm" System Co.....Cleveland.

CABIN AND CABINET FINISHING WOODS.

Martin-Barriss Co.....Cleveland.

CANVAS SPECIALTIES.

Baker & Co., H. H.....Buffalo.
Bunker, E. A. .....New York.
Upson-Walton Co.....Cleveland.

CAPSTANS.

American Ship Windlass Co..Providence, R. I.
Hyde Windlass Co.....Bath, Me.
Marine Mfg. & Supply Co.....New York.

CARPETS, RUGS AND FURNITURE.

Williams & Rodgers Co.....Cleveland.

CEMENT, IRON FOR REPAIRING LEAKS.

Smooth-On Mfg. Co.....Jersey City, N. J.

CHAINS.

Woodhouse Chain Works.....Trenton, N. J.

CHAIN CONVEYORS, HOISTS.

Brown Hoisting Machinery Co. (Inc.).... ..... Cleveland.
General Electric Co.....Schenectady, N. Y.

CHAIN HOISTS.

Boston & Lockport Block Co....Boston, Mass.

CHARTS.

Penton Publishing Co.....Cleveland.
Potter, J. D.....London.

CLOCKS (Marine and Ship's Bell) AND CHRONOMETERS.

Ashton Valve Co.....Boston.
Ritchie, E. S. & Sons.....Brookline, Mass.

COAL PRODUCERS AND SHIPPERS.

Hanna, M. A. & Co.....Cleveland.
Ironville Dock & Coal Co.....Toledo, O.
Pickands, Mather & Co.....Cleveland.
Pittsburg Coal Co.....Cleveland.

COAL AND ORE HANDLING MACHINERY.

Brown Hoisting Machinery Co. (Inc.).... ..... Cleveland.
Link Belt Machinery Co.....Chicago.
McMyler Mfg. Co.....Cleveland.

COMPASSES.

Ritchie, E. S. & Sons.....Brookline, Mass.

CONDENSERS.

Great Lakes Engineering Works.....Detroit.
Thropp & Sons Co., John E...Trenton, N. J.

CONTRACTORS FOR PUBLIC WORKS.

Breymann & Bros., G. H.....Toledo.
Buffalo Dredging Co.....Buffalo.
Chicago & Gt. Lakes Dredge & Dock Co. ..... Chicago.
Dunbar & Sullivan Dredging Co.....Buffalo.
Fitz-Simons & Connell Co.....Chicago.
Hickler Bros.....Sault Ste. Marie, Mich.
Lake Superior Contracting & Dredging Co., ... Duluth, Minn.
Smith Co., L. P. & J. A.....Cleveland.
Starke Dredge & Dock Co., C. H..Milwaukee.
Sullivan, M.....Detroit.

CORDAGE.

Baker & Co., H. H.....Buffalo.
Upson-Walton Co.....Cleveland.

CORK JACKETS AND RINGS.

Armstrong Cork Co.....Pittsburg, Pa.
Kahnweiler's Sons, D.....New York.

CRANES, TRAVELING.

Brown Hoisting Machinery Co.....Cleveland.
McMyler Mfg. Co.....Cleveland.

DIVING APPARATUS.

Morse, A. J. & Son.....Boston.
Schrader's Son, A.....New York.

DREDGING CONTRACTORS.

Breymann & Bros., G. H.....Toledo.
Buffalo Dredging Co.....Buffalo.
Chicago & Gt. Lakes Dredge & Dock Co. ..... Chicago.
Dunbar & Sullivan Dredging Co.....Buffalo.
Fitz-Simons & Connell Co.....Chicago.
Hickler Bros.....Sault Ste. Marie, Mich.
Lake Superior Contracting & Dredging Co. ..... Duluth, Minn.
Smith Co., L. P. & J. A.....Cleveland.
Starke Dredge & Dock Co., C. H..Milwaukee.
Sullivan, M.....Detroit.

DRYING APPARATUS.

Sturtevant, B. F. Co.....Hyde Park, Mass.

DRY DOCKS.

American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Buffalo Dry Dock Co.....Buffalo.
Chicago Ship Building Co.....Chicago.
Craig Ship Building Co.....Toledo, O.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Ship Building Co.....Detroit.
Great Lakes Engineering Works.....Detroit.
Lockwood Mfg. Co.....East Boston, Mass.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co..... .....Newport News, Va.
Shipowners Dry Dock Co.....Chicago.
Superior Ship Building Co....Superior, Wis.

ELECTRIC HOISTS AND CRANES.

General Electric Co.....Schenectady, N. Y.

ELECTRIC LIGHT AND POWER PLANTS.

General Electric Co.....Schenectady, N. Y.
Mietz, Aug. .....New York.
Sturtevant, B. F. & Co.....Hyde Park, Mass.
Thropp & Sons, John E.....Trenton, N. J.

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WANTED and FOR SALE Department.

PROPOSALS.

Treasury Department, Office of General Superintendent U. S. Life-Saving Service, Washington, D. C., April 4, 1905. Sealed proposals will be received at this office until 2 o'clock p.m. of Friday the 28th day of April, 1905, and then publicly opened, for furnishing supplies required for use of the Life-Saving Service for the fiscal year ending June 30, 1906; the supplies to be delivered at such points in New York City, Grand Haven, Mich., and San Francisco, Cal., as may be required, and in the quantities named in the specifications. The supplies needed consist of Beds and Bedding; Blocks and Sheaves; Cordage; Crockery; Furniture; Hardware, Lamps, Lanterns, etc.; Medicines, etc.; Paints, Oils, etc.; Ship Chandlery; Stoves, etc.; Tools, and Miscellaneous Articles; all of which are enumerated in the specifications attached to the form of bid, etc., which may be obtained upon application to this office, or to the Inspector of Life-Saving Stations, 17 State Street, New York City; Superintendent Twelfth Life-Saving District, Grand Haven, Mich., and Superintendent Thirteenth Life-Saving District, New Appraisers' Stores, San Francisco, Cal. Envelopes containing proposals should be addressed to the "General Superintendent U. S. Life-Saving Service, Washington, D. C.," and marked on the outside "Proposals for Annual Supplies." The right is reserved to reject any or all bids, and to waive defects if deemed for the interests of the Government. S. I. Kimball, General Superintendent. April 20

SEALED PROPOSALS will be received at the office of the Light-House Board, Washington, D. C., until 2 o'clock p.m., May 18, 1905, and then opened, for furnishing the materials and labor of all kinds necessary for the construction and delivery of the single-screw steel steam light-vessel, No. 82, in accordance with specifications, copies of which, with blank proposals and other information, may be had upon application to Rear Admiral B. P. Lamberton, U. S. N., Chairman. April 20

PROPOSALS FOR REPAIRING BREAKWATER.—U. S. Engineer Office, 262 Huron Street, Cleveland, O., April 3, 1905. Sealed proposals for repairing the shore end of the West Breakwater at Cleveland Harbor, Ohio, will be received at this office until 2 P.M., May 6, 1905, and then publicly opened. Specifications, blank forms, and all available information will be furnished on application to this office. DAN C. KINGMAN, Lieut. Col. Corps of Engineers, U. S. A. April 27

PROPOSALS FOR SHEATHING BREAKWATER.—U. S. Engineer Office, 262 Huron Street, Cleveland, O., April 3, 1905. Sealed proposals for sheathing the harbor face of the West Breakwater at Cleveland Harbor, Ohio, will be received at this office until 2 P.M., May 6 1905, and then publicly opened. Specifications, blank forms and all available information will be furnished on application to this office. DAN C. KINGMAN, Lieut. Col. Corps of Engineers, U. S. A. April 27

PROPOSALS FOR RIPRAP STONE FILLING.—U. S. Engineer Office, 262 Huron Street, Cleveland, O., April 3, 1905. Sealed proposals for filling with large riprap along the lake face of the West Breakwater at Cleveland Harbor, Ohio, will be received at this office until 2 P.M. May 6, 1905, and then publicly opened. Specifications, blank forms and all available information will be furnished on application to this office. DAN C. KINGMAN, Lieut. Col. Corps of Engineers, U. S A. April 27

PROPOSALS.

PROPOSALS FOR CONSTRUCTION OF BREAKWATER.—U. S. Engineer Office, 262 Huron Street, Cleveland O., April 4, 1905. Sealed proposals for constructing the shore end of the West Breakwater at Fairport Harbor, Ohio, will be received at this office until 2 P.M. May 6, 1905, and then publicly opened. Specifications, blank forms, and all available information will be furnished on application to this office. DAN C. KINGMAN, Lieut. Col. Corps of Engineers, U. S. A. Apr. 27.

FOR SALE.

Patent on Valuable Nautical Invention.

A device in the form of an air buoy for definitely locating sunken vessels. Should the vessel sink upon which this buoy is placed, the buoy floats, and a line, made fast in a separate compartment, unreels until the vessel strikes bottom, thereby locating the exact position of the sunken vessel. This buoy is also adapted for use as a mooring buoy for yachts of all sizes, and for all floating property. It can be manufactured and sold for much less than any other buoy in use. Will sell the patent for cash or exchange for vessel or other property. Address, Capt. J. Fred Tribble, 59 Broadway, Norwich, Conn. Apr. 13

Launches for Sale.

Gasoline shallow draft launches, 18 and 20 ft.; 3 h. p. sure spark motors, speed up, slow down, our lever control; the same as have been used on Susquehanna river and Danville and Bervick as ferries for the last year through flood and ice. Write for catalogue. E. B. Brower Co., Bloomsburg, Pa. Apr. 13

Tug Wm. Engel.

A first class fishing rig for sale. Tug suitable for fishing or towing. For further information write to Thomas Mader, 81 Middle St., Kenosha, Wis. t.f

Gasoline Tug for Sale.

For Sale—First class gasoline tug 43 ft. long, 9½ ft. beam, 16 h. p. Sintz gasoline engine and equipment in perfect working order. Address, Morton Ryan, 31 River St., Buffalo, N. Y. Apr. 13

Launch For Sale.

42-foot full cabin, mahogany finished cruising launch. Handsomely upholstered; full inventory; first class condition. Address W. E. Mallory, Danbury, Conn. Apr. 13

FOR SALE.

Lake Tug for Sale.

Tug Kate Williams—rebuilt 1901, rates 1½. Moored Manitowoc, Wis., where she may be inspected. For prices and terms address Lake Shore Stone Co., Milwaukee, Wis. Apr. 20

Dredging Outfits for Sale.

Two dipper dredges one partly burned; two combination dipper and clam shell dredges; four tugs; dump scows; flat scows; dredging appliances. Complete business to be closed out. For particulars address Carkin, Stickney & Cram, Detroit. Apr. 20

Motor Boat For Sale.

On the St. Lawrence river: A specially built motor boat, 32x6, fitted with a double cylinder, 14 horse motor. A remarkably beautiful and excellent boat, but as the owner thinks it too small for his use, will sacrifice so as to build a larger one. Big bargain for some one. It is almost finished. Do not overlook this. I have dozens of other hulls in stock, all sizes, all prices, or will build to order anything you want. Henry E. Francis, Jr., Alexandria Bay, N. Y. t.f

For Sale.

Marine boiler and engine complete. Boiler 4 x 8, allowed 120 lbs. steam. Engine 12 square, high pressure. All in good condition. Address Box 48, Sandusky, O. April 20

Steam Yacht for Sale.

A 71 foot steam yacht, thoroughly up to date, of handsome lines; a splendid sea boat; perfectly equipped and in order, and well adapted for Southern or South American waters; an excellent boat for cruising; now getting ready to go into commission; photographs and particulars submitted. A Mugford, 136 Liberty St., New York. April 27

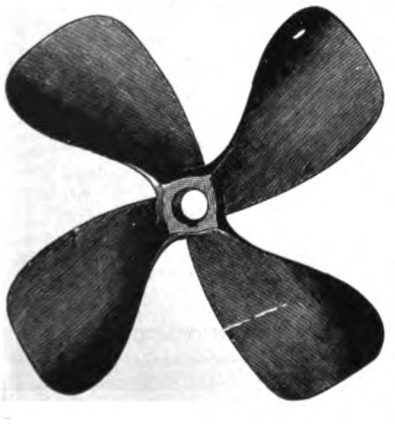
Lighter for Sale.

Lighter Annie Walker for sale. Hull 93x20x9½. House 79x18x8. Address, Mutual Transit Co., Buffalo, N. Y. Apr. 20

Steam Yacht Cygnet
FOR SALE.

J. L. ALBERGER,
Ellicott Square, - BUFFALO, N. Y.
Apr. 13

Thirty Years' Experience building



Engines and Propeller Wheels.

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BUFFALO, N. Y.

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Buyers' Directory of the Marine Trade.—*Continued.*

ENGINE BUILDERS, MARINE.

American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Bertram Engine Works Co., Ltd.....
.....Toronto, Can.
Chicago Ship Building Co.....Chicago.
Chase Machine Co.....Cleveland.
Cramp, Wm. & Sons.....Philadelphia.
Craig Ship Building Co.....Toledo, O.
Dake Engine Co.....Grand Haven, Mich.
Detroit Ship Building Co.....Detroit.
Fletcher, W. & A. Co.....Hoboken, N. J.
Fore River Shipbuilding Co....Quincy, Mass.
Great Lakes Engineering Works..Detroit, Mich.
Hall Bros. .....Philadelphia.
Lockwood Mfg. Co.....East Boston, Mass.
Marine Iron Works.....Chicago.
Maryland Steel Co.....Sparrows Point, Md.
Mietz, Aug.....New York.
Milwaukee Dry Dock Co.....Milwaukee.
Mosher, Chas. D.....New York.
Moulton Steering Engine Co.....New York.
Newport News Ship Building Co.....
.....Newport News, Va.
New York Shipbuilding Co....Camden, N. J.
Northwestern Steam Boiler & Mfg. Co...
..... Duluth, Mich.
Roach's Ship Yard.....Chester, Pa.
Sheriffs Mfg. Co.....Milwaukee.
Superior Ship Building Co....Superior, Wis.
Thropp, J. E. & Sons Co.....Trenton, N. J.
Trout, H. G.....Buffalo.
Willard, Chas. P. & Co..Winthrop Harbor, Ill.

ENGINE ROOM TELEGRAPH, CALL BELLS, ETC.

Cory, Chas. & Son.....New York.
Marine Mfg. Supply Co.....New York.

ENGINE TESTING.

Kreer & Parsons.....Chicago.

ENGINEERING SPECIALTIES AND SUPPLIES.

Crane Co. .....Chicago.
Kieley & Mueller .....New York.
Lunkenheimer Co. .....Cincinnati.
New York Belting & Packing Co..New York.
Northwestern Steam Boiler & Mfg. Co...
..... Duluth, Minn.

ENGINEERS, MARINE, MECHANICAL, CONSULTING.

Hynd, Alexander .....Cleveland.
Hunt, Robt. W. & Co.....Chicago.
Kidd, Joseph.....Duluth, Minn.
Kreer & Parsons.....Chicago.
Lovejoy, H. O.....Buffalo.
Mosher, Chas. D.....New York.
Nacey, James .....Cleveland.
Rice, Henry .....Buffalo.
Roelker, H. B. .....New York.
Wood, W. J. .....Chicago.

FANS FOR VENTILATION, EXHAUST, ETC.

Sturtevant, B. F. Co.....Hyde Park, Mass.

FEED WATER PURIFIERS AND HEATERS.

Greacen-Derby Engineering Co.....
.....Perth Amboy, N. J.
Reilly Repair and Supply Co., Jas..New York.
Ross Valve Co.....Troy, N. Y.

FIXTURES FOR LAMPS, OIL OR ELECTRIC.

General Electric Co.....Schenectady, N. Y.

FORGES.

Sturtevant, B. F. Co.....Boston.

FORGINGS FOR CRANK, PROPELLER OR THRUST SHAFTS, ETC.

Cleveland City Forge & Iron Co...Cleveland.
Fore River Shipbuilding Co.....Quincy, Mass.
Macbeth Iron Co.....Cleveland.

FLUE WELDING.

Fix's, S. Sons.....Cleveland.

FUEL ECONOMIZERS.

Sturtevant Co., B. F.....Hyde Park, Mass.

FUELING COMPANIES AND COAL DEALERS.

Hanna, M. A. & Co.....Cleveland.
Ironville Dock & Coal Co.....Toledo, O.
Parker Bros. Co., Ltd.....Detroit.
Pickands, Mather & Co.....Cleveland.
Pittsburg Coal Co.....Cleveland.
Smith, Stanley B., & Co.....Detroit.
Smith Coal & Dock Co., Stanley B. Toledo, O.

FUELING PLANTS, BUILDERS OF

Link Belt Machinery Co.....Chicago.

FURNACES FOR BOILERS.

Continental Iron Works.....New York.

GASKETS, RUBBER.

New York Belting & Packing Co...New York.

GAS BUOYS.

Safety Car Heating & Lighting Co..New York.

GAS AND GASOLINE ENGINES.

Chase Machine Co.....Cleveland.
Georgian Bay Engineering Works.....
.....Midland, Ont.

GAUGES, STEAM AND VACUUM.

American Steam Gauge & Valve Mfg. Co
..... Boston.
Ashton Valve Co.....Boston.
Lunkenheimer Co. .....Cincinnati.

GAUGES, WATER.

Bonner & Co., Wm. T.....Boston.
Lunkenheimer Co. .....Cincinnati, O.

GRAPHITE.

Dixon Crucible Co., Joseph..Jersey City, N. J

GREASE EXTRACTORS.

Greacen-Derby Engineering Co.....
.....Perth Amboy, N. J.

HAMMERS, STEAM.

Chase Machine Co.....Cleveland.

HEATING APPARATUS.

Sturtevant, B. F. Co.....Hyde Park, Mass.

HOISTS FOR CARGO, ETC.

American Ship Building Co.....Cleveland.
Brown Hoisting Machinery Co. (Inc.)....
..... Cleveland.
Chase Machine Co.....Cleveland.
General Electric Co.....New York.
Georgian Bay Engineering Works.....
.....Midland, Ont.
Hyde Windlass Co.....Bath, Me.
McMyler Mfg. Co.....Cleveland.
Marine Iron Co.....Bay City.
Mietz, Aug. .....New York.

HOLLOW STAYBOLT IRON.

Falls Hollow Staybolt Co...Cuyahoga Falls, O.

HOSE, RUBBER.

New York Belting & Packing Co..New York.

HYDRAULIC DREDGES.

Great Lakes Engineering Works.....Detroit.

HYDRAULIC TOOLS.

Watson-Stillman Co., The.....New York.

ICE MACHINERY.

Great Lakes Engineering Works.....Detroit.
Roelker, H. B.....New York.

INDICATORS FOR STEAM ENGINES.

American Steam Gauge Co.....Boston.
Ashton Valve Co.....Boston.

INJECTORS.

American Injector Co.....Detroit.
Crane Co. .....Chicago.
Jenkins Bros. .....New York.
Lunkenheimer Co.....Cincinnati.
Penberthy Injector Co.....Detroit, Mich.

INSURANCE, MARINE.

Elphicke, C. W. & Co.....Chicago.
Fleming & Co., E. J.....Chicago.
Gilchrist & Co., C. P.....Cleveland.
Hawgood & Co., W. A.....Cleveland.
Helm & Co., D. T.....Duluth.
Hutchinson & Co.....Cleveland.
McCarthy, T. R.....Montreal.
McCurdy, Geo. L.....Chicago.
Mitchell & Co.....Cleveland.
Parker Bros. Co., Ltd.....Detroit.
Peck, Chas. E. & W. F..New York & Chicago.
Prindiville & Co.....Chicago.
Richardson, W. C.....Cleveland.
Sullivan, D. & Co.....Chicago.

IRON CASTINGS.

Reading Iron Co.....Reading, Pa.

IRON ORE AND PIG IRON.

Bourne-Fuller Co.....Cleveland, O.
Hanna, M. A. & Co.....Cleveland.
Pickands, Mather & Co.....Cleveland.
Reading Iron Co.....Reading, Pa.

LAUNCHES—STEAM, NAPHTHA, ELECTRIC.

Georgian Bay Engineering Works.....
.....Midland, Ont.
Marine Iron Works.....Chicago.
Truscott Boat Mfg. Co.....St. Joseph, Mich.
Willard, Chas. P.....Winthrop Harbor, Ill.

LIFE PRESERVERS, LIFE BOATS, BUOYS.

Armstrong, Cork Co.....Pittsburg.
Drein, Thos. & Son.....Wilmington, Del.
Kahnweiler's Sons, D.....New York.

LIGHTS, SIDE AND SIGNAL.

Russell & Watson .....Buffalo.

LOGS.

Nicholson Ship Log Co.....Cleveland.
Walker & Sons, Thomas....Birmingham, Eng.
Also Ship Chandlers.

LUBRICATING GRAPHITE.

Dixon Crucible Co., Joseph..Jersey City, N. J.

LUBRICATORS.

Crane Co.....Chicago.
Lunkenheimer Co. .....Cincinnati.

LUMBER.

Martin-Barriss Co.....Cleveland.

MACHINISTS.

Chase Machine Co.....Cleveland.
Hickler Bros.....Sault Ste. Marie, Mich.
Lockwood Mfg. Co.....East Boston, Mass.

MACHINE TOOLS (WOOD WORKING).

Atlantic Works, Inc.....Philadelphia.

MARINE RAILWAYS.

Hickler Bros.....Sault Ste. Marie, Mich.

MARINE RAILWAYS, BUILDERS OF.

Crandall & Son, H. I.....East Boston, Mass.

MATTRESSES, CUSHIONS, BEDDING.

Fogg, M. W.....New York.

MECHANICAL DRAFT FOR BOILERS.

American Ship Building Co.....Cleveland.
Detroit Ship Building Co.....Detroit.
Great Lakes Engineering Works.....Detroit.
Sturtevant, B. F. Co.....Hyde Park, Mass.

METALLIC PACKING.

Katzenstein, L. & Co.....New York.

METAL POLISH.

Bertram's Oil Polish Co.....Boston.

MOTORS, GENERATORS—ELECTRIC.

Fisher Electrical Works.....Detroit.
General Electric Co.....Schenectady, N. Y.
Sturtevant, B. F. Co.....Hyde Park, Mass.

NAUTICAL INSTRUMENTS.

Ritchie, E. S., & Sons.....Brookline, Mass.

NAVAL ARCHITECTS.

Hynd, Alexander .....Cleveland.
Kidd, Joseph .....Duluth, Minn.
Kreer & Parsons.....Chicago.
Lovejoy, H. O. .....Buffalo.
Matteson & Drake.....Philadelphia.
Mosher, Chas. D.....New York.
Nacey, James .....Cleveland.
Rice, Henry .....Buffalo.
Wood, W. J. .....Chicago.

OAKUM.

Stratford, Oakum Co.....Jersey City, N. J.

OIL ENGINES.

Mietz, Aug. .....New York.

OILS AND LUBRICANTS.

Dixon Crucible Co., Joseph..Jersey City, N. J.
Standard Oil Co.....Cleveland.

PACKING.

Crane Co. .....Chicago.
Jenkins Bros. .....New York.
Katzenstein, L. & Co.....New York.
New York Belting & Packing Co..New York.

PAINTS.

Baker, Howard H. & Co.....Buffalo.
Carbolineum Wood Preserving Co..Milwaukee.
New Jersey Zinc Co.....New York.
Upson-Walton Co. .....Cleveland.

PATTERN SHOP MACHINERY.

Atlantic Works, Inc.....Philadelphia.

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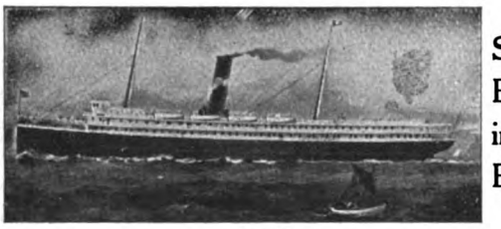

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U. S. Protected Cruiser Des Moines.
U. S. Battleships New Jersey and Rhode Island.
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Repairing of Hulls and Machinery.

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Buyers' Directory of the Marine Trade.—*Continued.*

PILE DRIVING AND SUBMARINE WORK.

Buffalo Dredging Co.....Buffalo.
Chicago & Gt. Lakes Dredge & Dock Co. ..... Chicago.
Dunbar & Sullivan Dredging Co.....Buffalo.
Fitz-Simons & Connell Co.....Chicago.
Hickler Bros.....Sault Ste. Marie, Mich.
Lake Superior Contracting & Dredging Co. ..... Duluth, Minn.
Parker Bros. Co., Ltd.....Detroit.
Smith Co., L. P. & J. A.....Cleveland.
Starke Dredge & Dock Co., C. H..Milwaukee.
Sullivan, M..... Detroit

PIPE, WROUGHT IRON.

Bourne-Fuller Co.....Cleveland, O.
Crane Co. .....Chicago.
Macbeth Iron Co.....Cleveland.
Reading Iron Co.....Reading, Pa.

PLANING MILL MACHINERY.

Atlantic Works, Inc.....Philadelphia.

PLATES—SHIP, STRUCTURAL, ETC.

Bourne-Fuller Co.....Cleveland, O.
Otis Steel Co.....Cleveland.
Reading Iron Co.....Reading, Pa.

PRESSURE REGULATORS.

Kieley & Mueller .....New York.
Ross Valve Co.....Troy, N. Y.

PROPELLER WHEELS.

American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Ship Building Co.....Detroit.
Fore River Shipbuilding Co.....Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Hyde Windlass Co.....Bath, Me.
Lockwood Mfg. Co. .....East Boston, Mass.
Marine Iron Works.....Chicago.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co..... .....Newport News, Va.
Roelker, H. B.....New York.
Sheriffs Mfg. Co.....Milwaukee.
Superior Ship Building Co....Superior, Wis.
Thropp & Sons Co., J. E.....Trenton, N. J.
Trout, H. G.....Buffalo.

PROJECTORS, ELECTRIC.

General Electric Co.....Schenectady, N. Y.

PUMPS FOR VARIOUS PURPOSES.

Blake, Geo. F., Mfg. Co.....New York.
Great Lakes Engineering Works.....Detroit.
Marine Iron Works.....Chicago.
Kingsford Foundry & Machine Works.... .....Oswego, N. Y.

RANGES.

Stamford Foundry Co.....Stamford, Conn.

REFRIGERATING APPARATUS.

Great Lakes Engineering Works.....Detroit.
Roelker, H. B.....New York.

REGISTER FOR CLASSIFICATION OF VESSELS.

Great Lakes Register.....Cleveland.

REPAIRS—ENGINE AND BOILER.

(See also Boiler Manufacturers and Engine Builders.)
Georgian Bay Engineering Works..... .....Midland, Ont.

RIVETS, STEEL FOR SHIPS AND BOILERS.

Bourne-Fuller Co.....Cleveland, O.

SAFETY VALVES.

American Steam Gauge & Valve Mfg. Co. ..... Boston.
Ashton Valve Co.....Boston.
Crane Co. .....Chicago.
Lunkenheimer Co. .....Cincinnati.

SAIL MAKERS.

Baker, Howard H. & Co.....Buffalo.
Upson-Walton Co.....Cleveland.

SALVAGE COMPANIES.

See Wrecking Companies.

SEARCH LIGHTS.

General Electric Co.....Schenectady, N. Y.

SHEARS.

See Punches, Rivets, and Shears.

SHIP AND BOILER PLATES AND SHAPES.

Bourne-Fuller Co.....Cleveland, O.
Otis Steel Co.....Cleveland.
Reading Iron Co.....Reading, Pa.

SHIP BUILDERS.

American Ship Building Co.....Cleveland.
Atlantic Works .....East Boston, Mass.
Bertram Engine Works Co., Ltd. Toronto, Can.
Buffalo Dry Dock Co.....Buffalo.
Cramp, Wm. & Sons.....Philadelphia.
Craig Ship Building Co.....Toledo, O.
Chicago Ship Building Co.....Chicago.
Detroit Ship Building Co.....Detroit.
Fore River Shipbuilding Co.....Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Lockwood Mfg. Co.....East Boston, Mass.
Maryland Steel Co.....Sparrows Point, Md.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co..... .....Newport News, Va.
New York Shipbuilding Co....Camden, N. J.
Roach's Ship Yard.....Chester, Pa.
Shipowner's Dry Dock Co.....Chicago.
Smith & Son, Abram.....Algonac, Mich.
Willard, Chas. P. & Co. Winthrop Harbor, Ill.

SHIP CHANDLERS.

Baker, Howard H. & Co.....Buffalo.
Marine Mfg. & Supply Co.....New York.
Upson-Walton Co.....Cleveland.

SHIP DESIGNERS.

Kidd, Joseph .....Duluth.
Kreer & Parsons .....Chicago.
Matteson & Drake .....Buffalo.
Rice & Lovejoy .....Buffalo.
Steel, Nacey & Hynd.....Cleveland.
Wood, W. J.....Chicago.

SHIP LANTERNS AND LAMPS.

Russell & Watson.....Buffalo.

SHIPMATE RANGES.

Stamford Foundry Co.....Stamford, Conn.

SHIP TIMBER.

Martin-Barriss Co.....Cleveland.

SMOOTH-ON COMPOUND, FOR REPAIRS.

Smooth-On Mfg. Co.....Jersey City, N. J.

STAYBOLTS, IRON OR STEEL, HOLLOW OR SOLID.

Falls Hollow Staybolt Co..Cuyahoga Falls, O.
Reading Iron Co.....Reading, Pa.

STEAM VESSELS FOR SALE.

Gilchrist & Co., C. P.....Cleveland.
Holmes, Samuel .....New York.
Lester, S. S.....Quebec, Can.
McCarthy, T. R.....Montreal, Can.

STEAMSHIP LINES, PASS. AND FREIGHT.

American Line .....New York.
Anchor Line .....Buffalo.
Boston Steamship Co.....Boston.
International Mercantile Marine Co..... ..... Philadelphia.
New York & Cuba Mail S. S. Co...New York.
Red Star Line.....New York.
United Fruit Co.....Boston

STEEL CASTINGS.

Otis Steel Co.....Cleveland.

STEERING APPARATUS.

American Ship Building Co.....Cleveland.
Chase Machine Co.....Cleveland.
Detroit Ship Building Co.....Detroit.
Hyde Windlass Co.....Bath, Me.
Marine Mfg. & Supply Co.....New York.
Moulton Steering Engine Co.....New York.
Sheriffs Mfg. Co.....Milwaukee.

SUBMARINE DIVING APPARATUS.

Morse & Son, A. J.....Boston.
Schrader's Son, A.....New York.

SURVEYORS, MARINE.

Gaskin, Edward .....Buffalo.
Hynd, Alexander .....Cleveland.
Lovejoy, H. O.....Buffalo.
Matteson & Drake .....Philadelphia.
Parker Bros. Co., Ltd.....Detroit.
Nacey, James .....Cleveland.
Rice, Henry .....Buffalo.
Steel, Adam .....Cleveland.
Wood, W. J.....Chicago.

TESTS OF MATERIALS.

Hunt, Robert W. & Co.....Chicago.
Lunkenheimer Co.....Cincinnati, O.

TILING, INTERLOCKING RUBBER.

New York Belting & Packing Co..New York.

TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.

Watson-Stillman Co.....New York.

TOOLS, WOOD WORKING.

Atlantic Works, Inc.....Philadelphia.

TOWING MACHINES.

American Ship Windlass Co..Providence, R. I.
Chase Machine Co.....Cleveland.

TOWING COMPANIES.

Donnelly Salvage & Wrecking Co..... .....Kingston, Ont.

TRAPS, STEAM.

Kieley & Mueller .....New York.
Sturtevant Co., B. F.....Hyde Park, Mass.

TRUCKS.

Boston & Lockport Block Co.....Boston.

TUBING, SEAMLESS.

Shelby Steel Tube Co.....Pittsburg, Pa.

VALVES, STEAM SPECIALTIES, ETC.

American Steam Guage & Valve Mfg. Co. ..... Boston.
Ashton Valve Co.....Boston.
Crane Co. .....Chicago.
Jenkins Bros. .....New York.
Kieley & Mueller.....New York.
Lunkenheimer Co.....Cincinnati.
Ross Valve Co.....Troy, N. Y.

VALVES FOR WATER AND GAS.

Lunkenheimer Co.....Cincinnati.
Ross Valve Co.....Troy, N. Y.

VARNISHES.

Detroit Varnish Co.....Detroit.
Detroit White Lead Works.....Detroit.
New Jersey Zinc Co.....New York.
Also Ship Chandlers.

VENTILATING APPARATUS FOR SHIPS.

Sturtevant, B. F. Co.....Hyde Park, Mass.

VESSEL AND FREIGHT AGENTS.

Boland, John J.....Buffalo.
Brown & Co.....Buffalo.
Elphicke, C. W. & Co.....Chicago.
Fleming & Co., E. J.....Chicago.
Gilchrist & Co., C. P.....Cleveland.
Hall, John B.....Buffalo.
Helm & Co., D. T.....Duluth.
Hawgood & Co., W. A.....Cleveland.
Holmes, Samuel .....New York.
Hutchinson & Co.....Cleveland.
Lester, S. S. .....Quebec, Can.
McCarthy, T. R.....Montreal.
Mitchell & Co.....Cleveland.
Parker Bros. Co., Ltd.....Detroit.
Prindiville & Co.....Chicago.
Richardson, W. C.....Cleveland.
Sullivan, D. & Co.....Chicago.

VESSEL FURNISHINGS.

Williams & Rodgers Co.....Cleveland.

WATER GAUGES.

Bonner & Co., Wm. T.....Boston.
Lunkenheimer Co.....Cincinnati, O.

WATERTIGHT BULKHEAD DOORS.

"Long Arm" System Co.....Cleveland.

WHISTLES, STEAM.

American Steam Gauge & Valve Mfg. Co. ..... Boston.
Ashton Valve Co.....Boston.
Lunkenheimer Co.....Cincinnati.

WILFORD'S WATERPROOF CLOTH.

Bunker, E. A. .....New York.

WIRE ROPE AND WIRE ROPE FITTINGS.

Baker, H. H. & Co.....Buffalo.
DeGrauw, Aymar & Co.....New York.
Upson-Walton Co.....Cleveland.

WINDLASSES.

American Ship Windlass Co..Providence, R. I.
American Ship Building Co.....Cleveland.
Hyde Windlass Co.....Bath, Me.
Marine Mfg. & Supply Co.....New York.

WINCHES.

American Ship Windlass Co..Providence, R. I.
Georgian Bay Engineering Works..... .....Midland, Ont.
Hyde Windlass Co.....Bath, Me.

WOOD PRESERVING PAINT.

Carbolineum Wood Preserving Co..Milwaukee.

WOOD WORKING MACHINERY.

Atlantic Works, Inc.....Philadelphia.

WRECKING AND SALVAGE COMPANIES.

Donnelly Salvage & Wrecking Co..... .....Kingston, Ont.
Parker Bros. Co., Ltd.....Detroit.

YACHT AND BOAT BUILDERS.

Bertram Engine Works Co., Ltd..Toronto, Can.
Drein, Thos. & Son.....Wilmington, Del.
Georgian Bay Engineering Works..... .....Midland, Ont.
Truscott Boat Mfg. Co.....St. Joseph, Mich.
Willard, Chas. P. & Co..... .....Winthrop Harbor, Ill.

YACHT BROKERS.

Clapham & Clapham.....New York.

YAWLS.

Drein, Thos. & Son.....Wilmington, Del.

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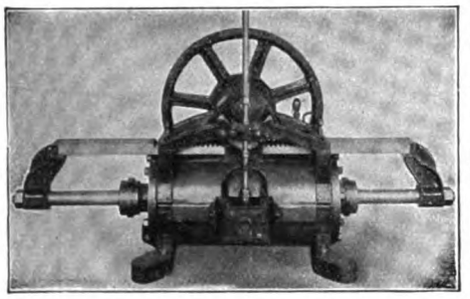

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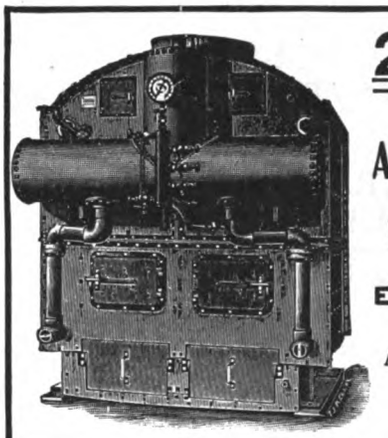

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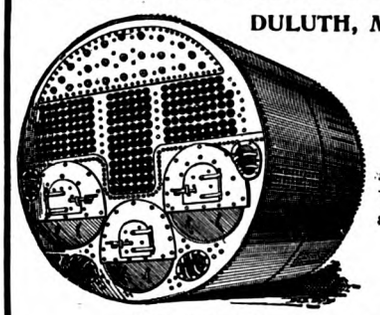

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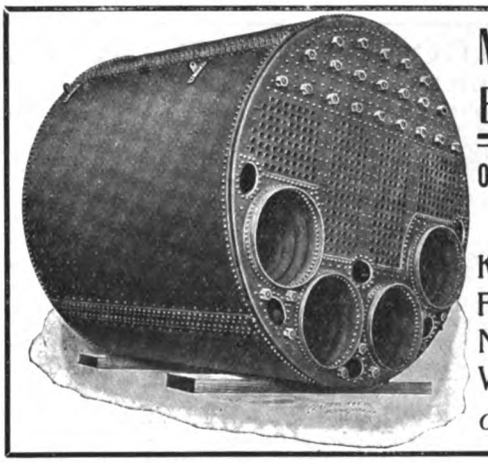

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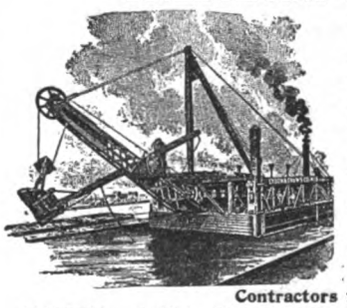

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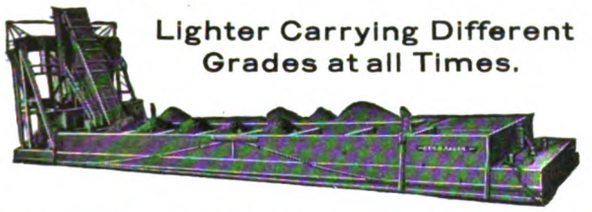

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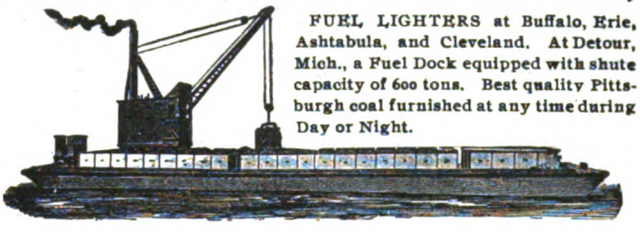

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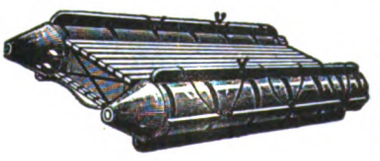

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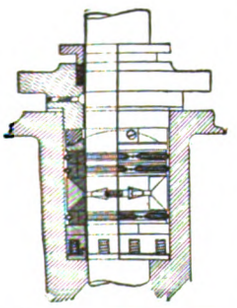

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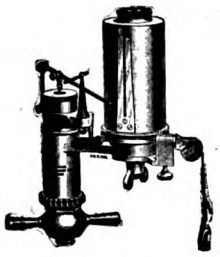

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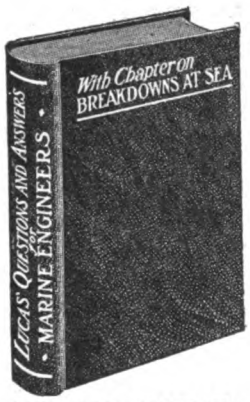

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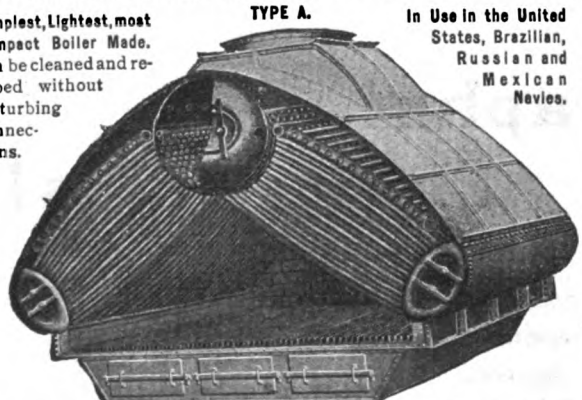

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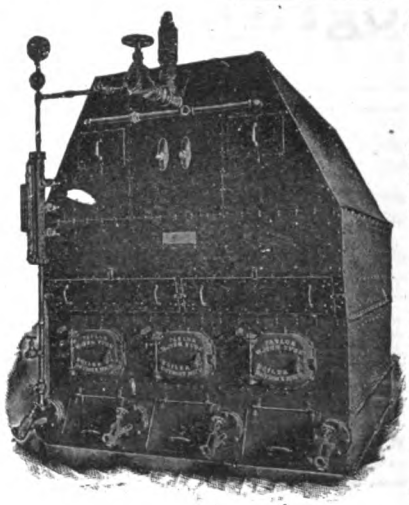

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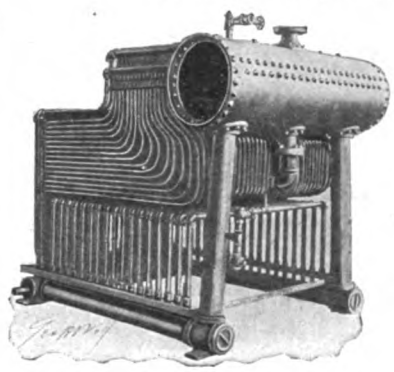

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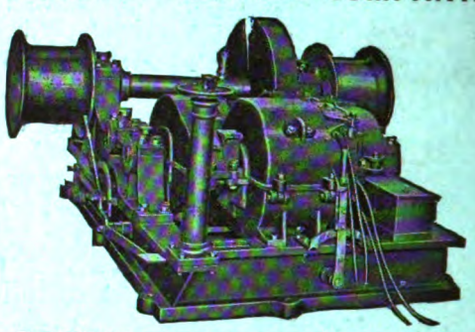

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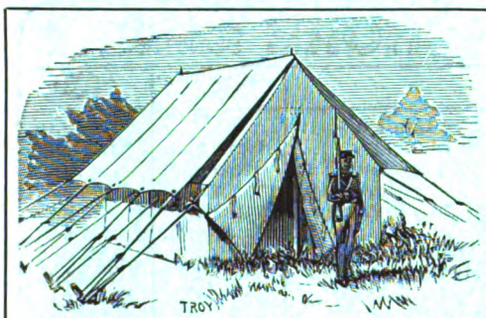

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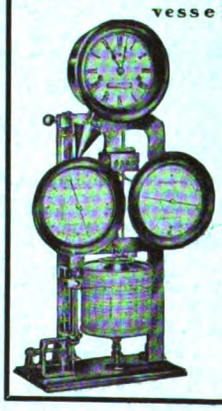

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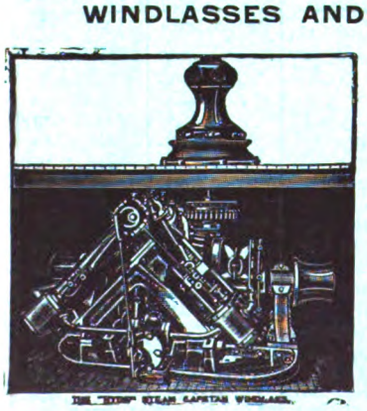

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